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"The Seas but Join the Nations they Divide."

THE

NAUTICAL MAGAZINE

FOR 1882.

NEW SERIES.

A JOURNAL OF PAPERS

ON SUBJECTS CONNECTED WITH

MARITIME AFFAIRS.

VOLUME LI.

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THE

NAUTICAL MAGAZINE

FIFTY-FIRST YEAR.

VOLUME LI.—No. I.

JANUARY, 1882.

EDITORIAL ADDRESS.

TO ALL WHOM IT MAY CONCERN.

WITH the present issue the *Nautical Magazine* commences the fifty-first year of its existence.

It is seldom that a periodical journal is so fortunate as to survive for half-a-century, but the *Nautical Magazine* being supported by one of the chief pillars of our national greatness, has lived on and progressed with the progress of British Shipping.

The chief purpose of the *Magazine* has been and still is, to supply trustworthy and useful information and criticism on matters bearing upon Navigation and Commerce, not merely as an ephemeral publication of the maritime news of the day with hasty comments, but rather a dispassionate chronicle and careful review, intended to serve the purposes of record and reference.

That the *Magazine* has supplied a want is sufficiently indicated by the support which for fifty years has been accorded to it, and the conductors venture to hope that the increased number of subscribers of late years may be regarded as a proof that their work has been done in a satisfactory and serviceable manner.

Actuated solely by the desire to promote the welfare and development of navigation and commerce as a means to the higher

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end of our national prosperity, the conductors will continue their work, and it is hoped that with the unfailing support of the maritime community, the "Old Nautical" may go on disseminating useful knowledge to the advantage of the sailor, the shipowner, the merchant and the country at large, until fifty years hence other hands may be able to call attention to the commencement of another epoch in the life of the *Nautical Magazine*, and to inscribe an address to the subscribers of 1932 on the completion of its one hundredth year of existence.

REGISTER AND GROSS TONNAGE.

IN a paper in our November number we dealt with the Report of the Majority of the Royal Commissioners on Tonnage, and the separate remarks of the three dissentient members, so far as they concerned the question of gross tonnage measurement; we now propose to consider their recommendations regarding allowances from the gross tonnage, for engine power in the case of steamers, and for crew, &c., in all vessels.

The rules for the allowances made to steamers in respect of their propelling power are prescribed by section 23 of the Merchant Shipping Act of 1854, as follows:—

(*a.*) As regards ships propelled by paddle wheels in which the tonnage of the space solely occupied by and necessary for the proper working of the boilers and machinery is above 20 per cent. of the gross tonnage of the ship, such deduction shall be 37-100ths of such gross tonnage; and in ships propelled by screws in which the tonnage of such space is above 13 per cent. and under 20 per cent. of such gross tonnage, such deduction shall be 32-100ths of such gross tonnage.

(*b.*) As regards all other ships the deduction shall, if the Board of Trade and the owner both agree thereto, be estimated in the same manner, but either they or he may in their or his discretion require the space to be measured and the deduction estimated accordingly; and whenever such measurement is so required the deduction shall consist of the tonnage of

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the space actually occupied by or required to be enclosed for the proper working of the boilers and machinery, with the addition in the case of ships propelled by paddle wheels of one-half, and in the case of ships propelled by screws of three-fourths of the tonnage of such space.

In practice the Board of Trade never does agree to the percentage allowance for cases below the lower limit, and the owner usually does not agree to it when the engine-room, &c., is above the upper limit. Occasionally, however, in cases of small vessels where the owner does not object to a large register tonnage, the percentage rule is applied when the engine-room is very large.

In their report the Commissioners discuss the reasonableness of making any allowance to steamers* in respect of their machinery and fuel spaces; and they also consider at length current objections to the existing law. These objections may be thus summarised:—

1. The allowances are generally excessive.
2. The principle of percentage limits is objectionable.
3. Owing to a verbal defect in the law, some spaces in some vessels are included in the allowances which do not form part of the gross tonnage.

The Government of the United States was the first to follow England in adopting the Moorsom system of tonnage, but they decided not to make any allowance to steamers. In this respect they stand alone, and it may be said that their experience on the subject is not worth very much, seeing that there are very few foreign-going steamers under the American flag. On this part of the question the Commissioners say in effect that it is impossible to abolish allowances to steamers even by Act of Parliament, they are in some shape or another a necessity of the case—"a virtual deduction for propelling space would have to be made, though in another form, involving a remodelling of all dock, harbour, Suez Canal, and Danube dues." The usual custom has always been

* The number and tonnage of registered sailing and steam vessels above fifty tons which belonged to the United Kingdom (exclusive of the Isle of Man and Channel Islands) in 1854 and 1880, is given as follows:—

Year		No.	Tonnage		No.	Tonnage
1854	Steamers ...	937	290,239	Sailing vessels ...	15,553	3,609,294
1880	„	3,786	2,688,769	„	11,569	3,545,528

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to charge dock dues irrespective of time up to a certain limit, fixed high enough to cover any time likely to be taken by a sailing vessel in discharging and loading. To charge all vessels upon gross tonnage and not to take time into account would mean an increase of the charges upon steamers of something like fifty per cent., and would necessarily be followed by one of two things, a reduced rate of dues for steamers or a revised scale for all vessels taking time into account. The former would in fact perpetuate and universalize the most objectionable feature of the present rules :—all steamers, whether they were fast passenger vessels or whether they had the smallest engines ever put into a ship, would get the same allowance, to the manifest advantage of the latter class. To charge by time would drive sailing ships out of the field. The necessities of the trade require that they should spend a long time in docks, waiting for freight; even when loaded they have often to wait for a fair wind, and to make such waiting a matter of further charges would practically cut off their means of existence. It may be said that a time charge is really fairest because it is a charge for accommodation provided, but it must be remembered in this connection that most of the large works of dock extension of late years have been undertaken to accommodate steamers, and that steamers have many special advantages accorded them by dock companies.

The Commissioners have, as regards the first objection we have stated, arrived at the conclusion that the average steamer of the present day gets a larger allowance than she is fairly entitled to. The present percentage deductions were fixed in 1854, and now owing to the very great improvements effected in machinery, the engines, boilers, and fuel necessary to drive a steamer of given size at given speed, occupy less space and are of much less weight than in 1854. Consequently to retain the relation to the steamer of the past, and to compare with the sailing ship as the steamer formerly did, the allowance should be decreased. Further, they say that they have in evidence "numerous instances of steam vessels discharging grain and other dead-weight cargo from distant ports largely in excess of the cargo that could be discharged by sailing vessels of the same register tonnage," and, "according to

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the evidence of the representatives of some of the dock companies the register ton then "—that is some years ago—"represented about 27 cwt. of cargo, and now indicates in the case of some steamers as much as 40 cwt." They also refer to the case of paddle steamers, which although few in number, yet include the class of vessels in which the engine-room is of excessive size, and hence afford extreme instances of the defects of the existing law. Some of these vessels have engine and boiler-rooms occupying more than half their hold, and hence they have a *minus* tonnage ; one tug, the *Clyde*, of Greenock, has a tonnage of *minus* 4·64, and as a consequence cannot be made to pay harbour and dock dues.

It has also been said that the present method of estimating the allowance is unfair, and in fact, has the effect of inducing shipbuilders to design their ships so that the engine-room shall be just thirteen per cent., and thus steamers of small or moderate power get the same allowance as those which have high power, whereas the space occupied by, and the displacement required for machinery, boilers, and coal in the former is really very much less than in the latter. A difference of a few tons in the actual size of the engine-room may, and does, often cause a difference of hundreds in the register tonnage. It was in evidence before the Commission that in the case of the steamer *Palestine*, of which the gross tonnage is 2,867, the present allowance for propelling power is 598 tons, but if the engine-room were increased in size to the amount of thirty tons only, the allowance would be increased to 917 tons. We need not enlarge upon the anomalous operation of the existing law for tonnage allowances in respect of machinery, and it is but justice to the memory of Mr. Moorsom, the originator of the present system of measurement, to say that he, far from being responsible for it, did all he possibly could to substitute for it a rule having some show of reason.

A further objection to the present law is grounded on the fact that by a recent interpretation of one of its clauses some steamers have claimed and obtained allowances in respect of spaces not in the gross tonnage. We quote what the Commissioners report in this regard :—

"The London and North-Western Railway Company, who are

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the owners of steam-vessels employed in the conveyance of passengers, cattle, and goods between Holyhead and Ireland, in applying in 1879 for a register for their new paddle steamship *Isabella*, claimed, in addition to the contents of engine and boiler spaces measured, plus 50 per cent., a further deduction of the contents of engine-room skylights and boiler casings above the deck, plus 50 per cent. thereon, notwithstanding that such contents had not previously been measured and included in the gross tonnage. The Board of Trade resisted this construction of the law as being contrary to the spirit of the Acts of 1854 and 1867, but agreed to refer the matter as a special case to the High Court of Justice. The claim of the owners of the *Isabella* was confirmed, and her nett register tonnage now stands at 337·9 tons against gross 842·4 tons. . . . Acting on the decision in the *Isabella* case, certain spaces above the uppermost deck, though not included in the gross tonnage, are now measured so that their contents may form a deduction from the tonnage arrived at by the measurement of under-deck spaces; and that is not all, as in the case of engine-room skylights, air boxes, and ventilating spaces, not only the contents of the space itself, but half as much again is deducted from gross tonnage. We are satisfied that such a construction of the Acts is due only to defects in expression, and that it is inconsistent with the principle and intention of the law, as well as with justice and convenience."

A short Bill was introduced last Session to remedy this obvious defect (in expression merely), of the existing law, but perished in the usual annual massacre of the innocents at the close of the Session. While there can be no doubt that the law will be very soon amended, in this respect at least, it may be as well to remark that the number of vessels affected is but small. The size of engine-rooms is for the same power less now than it was some years ago, and it is only a very limited number of vessels which are outside the range of the 32 per cent. allowance in the case of screw steamers. Paddle steamers are also not by any means on the increase, and a large number of them get only the 37 per cent. allowance.

An attempt was made to reform the generally acknowledged

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defects in the tonnage laws in the proposed Merchant Shipping Code of 1871, by allowing steamers a deduction of the total space actually occupied by engines, boilers, and coal bunkers. It was about that time that Germany, Austro-Hungary and Italy adopted the Moorsom system of tonnage, and they took the coal-bunker rule of allowance. Norway and Russia have adopted it since. There is one great objection to this rule, viz., that it is open to evasion unless some very strict definition of bunkers be adopted, and if this be done hardship may be inflicted and trade hampered. If coal-bunker space forms part of the allowance, some means must be adopted for the purpose of preventing that space being used for cargo ; and this would often be a source of great inconvenience in the case of homeward bound steamers. To meet the difficulty the International Commission which determined the method of ascertaining the Suez Canal tonnage of vessels, admitted as an alternative to the coal-bunker allowance, a rule by which the contents of the engine and boiler spaces being ascertained as in the English rules, the deduction should be once and three-quarters the actual amount of the engine and boiler space. This is the rule in force at present in Denmark, Spain, Holland, and Greece. The Commissioners propose to adopt it as an alternative to the coal-bunker rule, the option to rest with the owner of the vessel as is the case in Suez Canal tonnage. If this proposal be adopted, the coal-bunker rule will most probably be but little used, since in the majority of cases the larger allowance will be obtained by the alternative. Such is found to obtain in steamers using the Suez Canal, and if vessels in that trade where the proportion of coal consumption to cargo is large, do not find it to their advantage, it is pretty certain that those in the Atlantic, Baltic, or Mediterranean trades will not.

It should be added that in the Suez Canal tonnage and in the case of all the countries mentioned, there is a limitation of the allowance to one-half the gross tonnage. The rules used by France and Sweden are similar to our own in force at present, with the exception of the deductions being limited to a percentage of the gross tonnage.

The Commissioners propose to follow the Suez Canal rule in

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admitting either the coal-bunker, or the once and three-quarters rule at the option of the owner. In the case of paddle steamers, the alternative allowance would be once and a-half the actual contents of the engine and boiler space. In place, however, of the limitation of the Suez Canal rules, which is 50 per cent. of the gross tonnage, except in the case of tug-boats, they propose a limitation in the following terms: "Provided always, that the deduction for propelling space shall not exceed 33 per cent. of the gross tonnage of any screw steamer, and shall not exceed 50 per cent. of any paddle steamer." It is obviously desirable that tug-boats should not have an illimitable allowance, they at present furnish the most extreme instances of the anomalous operation of the present law. The Commissioners do not, however, give their reasons for their deviation from the Suez Canal rule, in respect of the limitation of the allowance to screw steamers.

The important feature in the proposal of the Commissioners is, however, the substitution of the once and three-quarters actual engine-room allowance for the present system. Probably, the content of the machinery and boiler spaces of steamers of the present day averages less than 14 per cent. of the gross tonnage, in many vessels, doubtless, engine-rooms if constructed only with regard to the necessities of the case, would be smaller than they are now. With an actual engine-room of 14 per cent., the new allowance would be $24\frac{1}{2}$ per cent. of the gross tonnage, at present it is 32 per cent. The average steamer would by the new rule get 7 to 8 per cent. less allowance than she gets now. This appears to be the main reason why Mr. John Glover did not join with the Majority of the Commissioners in signing the Report. He appears to have agreed with them as to the expediency of a limit of 33 and 50 per cent. respectively, which would dispose of many objections to the present law, but strongly dissents from a proposed change which would "involve an increase in the taxation on all British steamers of not less than 10 per cent." This we conceive is the strongest objection to the new rule, its force can only be properly estimated when the whole of the evidence of dock authorities, &c., is before the public. The Commissioners justify their recommendation by the well-known

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fact that coal consumption being so much less than when the old law was made, the corresponding allowance should be less also. Mr. Glover, on the other hand, says that "the fact came out at all points of the enquiry that steamer business was more profitable to the dock companies than sailing vessel business; that the short use of their quay and water space required by steamers made the result of the same charges on them as on sailing vessels more profitable to the dock companies; it was consequently evident that no serious ground of complaint existed, and the most important dock witnesses admitted as much." Even if Mr. Glover be right as to the inexpediency of making an alteration involving any material increase in steamship tonnage, this only tells against the figures of the proposed rule, not against its principle. In place of 1·75 of the actual engine and boiler space, say some other larger ratio giving an average result somewhat near the present, and we then have a rule very much sounder than that now in force, existing relations being still undisturbed. An allowance of twice the actual engine-room, for instance, would involve but a small concession to the dock companies, giving an average tonnage only slightly in excess of the present. Anyhow, the actual figures of the ratio are a matter of detail, the principle of the rule remains good whatever those figures may be. One argument advanced by Mr. Glover in favour of the present rule is that owners are now encouraged to appropriate an ample space for engine and boiler-rooms to the manifest benefit of the engineers and firemen, especially in warm climates. This we think tells quite as much for the proposed as for the existing rule. A shipowner is now induced to have a large and airy engine-room only when it would fall below the 13 per cent. limit if its size were regulated by bare necessity. By the proposed rule an inducement will be really held out in all ships, whatever their power. For every extra four tons of space included in the engine-room, the register tonnage of the ship will be decreased by seven tons. The inducement now held out is only capricious and partial; then it would be, if less in some cases, certain and regular in all.

Another of the dissentient Commissioners, Mr. Rothery, also exaggerates the difference in the tonnage of steamers which would

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be brought about by the proposed rules, and in his remarks says, their result would be "to add between 9 and 10 per cent. of the gross tonnage, or from 11 to 12 per cent. of the nett register to a large number, if not the majority of screw steam-vessels, increasing to that extent their dues, not in our own ports only, but in foreign ports, and this too without any corresponding advantage to ourselves, and without any increase in the tonnage of foreign vessels." Mr. Rothery does not appear to be aware of the fact that foreign steamers using English ports are at liberty at present to avail themselves of the 32 per cent. allowance, such as is accorded to English steamers, when by the rules of their own flag the allowance would be less. These vessels would of course, in the event of any change in the allowance, be subject to the same change as English steamers. Mr. Rothery, however, after complaining of the majority of his colleagues for proposing to decrease the allowance to steamers, himself advocates its total abolition.

In the system proposed by Mr. Waymouth, the allowance to steamers appears, though in altered form and very much smaller proportions. This tonnage which would be the deadweight of cargo, stores and coals, a vessel could carry, if loaded to an assigned maximum load-line, would exempt the deadweight of machinery and boilers from taxation, but would include the fuel.

Besides the allowance from tonnage in respect of propelling power, the Commissioners had to consider the minor questions arising out of crew space, and spaces for use in connection with the navigation of the ship.

The law as it at present stands deals with all these spaces, by prescribing the measurement of all "permanent closed-in spaces available for cargo or stores, or for the berthing or accommodation of passengers or crew." By this definition such small spaces as the lamp-room and chart-room, are included in the gross tonnage, while the wheel-house, donkey boiler-house, galley, &c., not being *available* for any of the purposes named, are left out of the account altogether. The crew space is allowed as a deduction by a clause in the Merchant Shipping Act of 1867. The large Merchant Shipping Act (that of 1854) exempted crew space from measurement

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altogether, provided it was in closed in spaces above the uppermost deck, and did not amount to more than 5 per cent. of the remaining gross tonnage of the ship. The Act of 1867 removed both the limit and restriction as to situation, but made the allowance contingent upon proper ventilation and other provisions for the comfort and health of the crew. Under both Acts the *crew* includes all on the ship's articles except the master.

The Suez Canal tonnage rules deal with this part of the subject by including in the gross tonnage "all spaces comprised within permanent constructions above that deck which are covered and closed in," and give an exact definition of such spaces as being "all those which are separated off by decks or coverings, or fixed partitions, and therefore represent an increase of capacity which might be used for the stowage of merchandise or for the berthing and accommodation of the passengers or of the officers and crew. Thus any one or more openings, either in the deck or coverings, or in the partitions, or a break in the deck, or the absence of a portion of the partition, will not prevent such cases being comprised in the gross tonnage if they can be easily closed-in after admeasurement, and thus better fitted for the transfer of goods and passengers." It is also further explained that this is not intended to include "spaces under awning-decks without other connection with the body of the ship than the props necessary for supporting them." It is hardly necessary for us to remark that *awning-deck* is here used in its natural meaning and not in the technical (but for all that most absurd) sense attached to it by Lloyd's Rules. Deductions from the tonnage are allowed by the Suez Canal rules for "the spaces exclusively and entirely occupied by the crew and the ship's officers, those taken up by the cook-house and latrines exclusively used by the ship's officers and crew, whether they be situated above or below the upper-deck; the covered and closed-in spaces if there be any situated on the upper-deck, and used for working the helm, the capstan, the anchor gear, and for keeping the charts, signals and other instruments of navigation." The aggregate deduction is, however, limited to 5 per cent. of the gross tonnage.

The Commissioners recommend that as regards the inclusion of

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spaces in the gross tonnage of the ship the Suez Canal rule should be followed. They do not, however, propose to follow those rules as regards the deductions, but recommend "that for the purpose of arriving at a register tonnage that shall, as nearly as is practicable, represent the actual space in a ship available for cargo, there should be added to the deduction at present made for crew space the contents of the master's cabin, provided it be used solely by the master and crew, and further, that there be deducted the contents of spaces used for the working of the helm, the capstan, the anchor gear, and for keeping the charts, signals, and other instruments of navigation and boatswain's stores, and also the spaces occupied by donkey-engine and boiler if connected with the main pumps of the ship. That sailing vessels be further allowed a deduction for the space occupied by the sail-rooms, this deduction not to exceed 2½ per cent. on the gross tonnage." They further recommend in this connection that all spaces above the upper-deck measured or deducted shall be specified on the ship's certificate of registry, and that carriage of passengers or cargo in any allowed spaces should be prohibited under penalty. The difference between all this and the present law does not amount to very much except as regards the sail-rooms. There is however, one advantage in the arrangement, the gross tonnage will be the gross tonnage of the Suez Canal rules, and the whole of the elements of that tonnage will be on the certificate of registry, only requiring the omission of some of the allowances to obtain it. This would be a distinct step nearer to an absolutely uniform international tonnage.

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OUR SEAMARKS.—VI.

LIGHTHOUSE ILLUMINATION.

IT is well known that in a general way the object of a lighthouse is to show a light at night, and popular knowledge on the subject seldom goes much further than this. The seaman, however, requires to make himself much more fully acquainted with the purposes of lighthouses, and in considering what his wants are in this respect, we shall be able to form some tolerably clear notions as to the functions and value of such seamarks.

Numerous lighthouses are placed at short intervals all round our coasts. From a lighthouse chart of the British Islands published a few years ago, in which the arc illuminated by each lighthouse is shown, it may be seen that the circles or segments of circles of light nearly everywhere overlap, thus forming a belt of illuminated sea all round our shores. Let us suppose the mariner coming from foreign parts to this country, and at night-time striking into this belt at one place or another, one or more of the coast lights becoming visible to him. He probably knows where he ought to be by his reckoning and soundings, but when he sights the lights he wants to recognise them in order that he may be confirmed as to his position. But, on the other hand, he may have been driven by various influences far out of his reckoning, and then if he should strike into the belt of light he is naturally in a state of great anxiety to find out on what part of the coast he has arrived, and for doing this at night time he is mainly dependent on being able to identify the lights he sees. In the day time the shape and colour of the lighthouse tower and cottages and the positions of other prominent objects on the coast, in conjunction with the soundings he obtains with his lead, enable him with certainty to say where he is.

It will be quite evident from the foregoing that the lights shown at night on a stretch of coast line must differ one from another; that no two lights exactly alike can be placed near to one another unless they are very close and intended to be used

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together. This necessity has given rise to the employment of different well-marked peculiarities in lights, simple in character, such as may be easily and immediately recognised by the navigator when the lights come into view. The system, if it may be so called, now in operation, is one which has grown with the growth of our shipping trade; which has been developed as new necessities arose, and is still capable of adaptation to altered conditions; which is understood by all nautical men; which affords a ready means of identifying the lights, and is generally agreed to be sufficient for the purposes in view.

There are two fundamental distinctions under one or other of which the majority of the different characteristics of lights may be grouped, viz. (*a*) Light which is fixed, *i.e.*, unbroken, or showing continuously; (*b*) Light which does not show continuously, but is broken by periods of darkness.

With fixed lights, variations are made by putting two lights close together and by the use of coloured glass, as for example, one distinction may be a single fixed white, another a single fixed red, another double fixed, *i.e.*, two lights, either both white, or one red the other white; and further obvious combinations will suggest themselves. Again the peculiar appearance of the electric light is in itself a distinctive feature for a fixed light.

With lights that are "on the move" the varieties are very numerous. Every one knows the character of the revolving light which, as has been previously explained, consists of a number of beams separated by dark intervals, the beams travelling round successively, each periodically illuminating the sea. The effect produced, as observed by the mariner, is that of waxing and waning, the beam faintly appearing at first, gradually swelling into its full strength and then slowly receding until it is lost sight of. This kind of light may be varied by altering the length of the dark intervals between the beams; for example, with a half minute revolving light a beam comes round every half minute, and with a one minute revolving light the beam is seen every minute, and so on. Another modification of this kind of light is produced by the addition of coloured beams which may be made to show alternately with the white beam, or the proportions may be varied by showing

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two coloured beams to one white, or *vice versa;* here again differences in the length of the dark periods may be made available for further distinctions.

Flashing lights constitute another class by means of which additional distinctions are obtained. The flashes of these lights differ from the waxing and waning beams of a revolving light in being shorter in duration, more sudden in appearing and disappearing, and are made to occur much more frequently. There is not much scope for differentiating these lights by time periods merely, half a minute being the longest interval of darkness which it is considered should separate the flashes, and this would be regarded as a slow flashing light; for quick flashing lights five or at most ten seconds dark intervals are employed. The intervention of coloured flashes is one of the practicable methods adopted for giving special characters to flashing lights, and is very effective, on account of the coloured and white flashes being brought suddenly into direct contrast. But the most important method of producing easily recognised differences in flashing lights is one of comparatively recent introduction, and is known as the group flashing system. Two, three, or four flashes are made to appear in quick succession, forming a group of flashes, each group being followed by a dark period of sufficient length to distinguish it from the very short intervals separating the flashes. The advantages of this method for distinctive purposes are numerous; the time distinctions can be brought into play, variations in the number of flashes in a group are available, and further distinctions may be made by the use of coloured flashes entirely, or alternately with white flashes. The most satisfactory results have already been obtained by this method, and its capabilities have not been developed to one-quarter of their full extent, so that there remains for use when required a store of distinctive characteristics which have never yet been applied. In some cases the revolving and flashing lights showing alternately red and white have no dark interval between the beams or flashes, thus practically continuous light is shown but changes in colour take place at regular intervals.

Hitherto we have dealt with lights the characteristic features of which have to do with the actual light itself, that is to say, the

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seaman has to note the peculiarities which the light itself exhibits. In the case of fixed lights he has to observe any special appearance about them, in the case of revolving or flashing lights he has to regard the nature and number of the beams or flashes, and at what intervals they appear. But with what are known as occulting lights, this order of things is reversed, and the mariner is told to observe the number and periods of the eclipses occurring in a light of this description, instead of noting the number and periods of flashes or beams. These eclipses or occultations are produced in a very simple manner by the automatic and periodic interposition and withdrawal of a screen in front of the light or by the dropping and lifting at stated times of a metal cylinder which surrounds the lamp chimney. The effect of these sudden obscurations and reappearances of the light is very striking, and if seamen can learn to concentrate their observing powers on the eclipses, it will open a wide field for the extension of distinctive features for lighthouses. But it is obvious that accustomed as mariners have been for so long a period to look out for flashes of light, there is some risk of their getting at times a little confused. Let us suppose, for instance, that in a certain light three occultations occur every half minute,—it is clear that between the occultations there will occur two short intervals of light which will appear to the mariner as two flashes in quick succession, he will thus be very liable to count the two flashes instead of the three eclipses, and so his ideas of the character of the light may become somewhat "mixed." But there can be no doubt that, supposing sailors to be capable of observing either flashes or eclipses as may be necessary, the occulting method is exceedingly well adapted for giving effective distinctions.

There have been of late years some ardent advocates of an elaborate and complex system of lighthouse characteristics which it has been suggested ought to be substituted for the arrangements now in force. The proposed scheme was based upon the alleged necessity of making every lighthouse indicate itself more plainly than at present, and the object was to be achieved by making all existing lights either flashing or occulting, and by means of combinations of long and short flashes, or occultations, each light was to be

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continually signalising a letter which should be appropriated to it, in accordance with the dot dash system of the Morse Telegraphic Code. The futility of this proposition has been exposed again and again, but we allude to it here in order to emphasize the merits which the present system possesses. Such a plan as that advocated above would require from the mariner much additional knowledge and more trained powers of observation; it would entail much additional watching on his part, and would occupy more time in determining the individuality of a light,—and at the most twenty-six distinctions only could be produced by the use, as proposed, of the Morse Alphabet, so that the same character of light would have to be repeated at comparatively short distances. On the other hand, by the system now in operation, two lights of the same character are seldom placed within 100 miles of each other; the characteristics named with one or two exceptions are familiar to all seamen, and as every light proclaims itself at once, its individuality can be fixed without the necessity of distinguishing between and counting dots and dashes of light, of determining what letter is indicated by any combination of such symbols, and then finding out to what lighthouse such letter is appropriated. Furthermore, the system now in operation has a large reserve of distinctions, and sailors are generally familiar with the distinctions employed.

The use of coloured lights for lighthouses deserves a few remarks. Red and green are the only tints made available, the latter very sparingly. As a great loss of power takes place after the passage of light through red or green glass, the use of colour is not so extended as might be supposed. Light through green glass suffers even more than light through red glass, but in the case of the latter, where it is necessary to place the red beams on an equality as regards power with the white ones, the ratio of the areas of the red and white panels has to be as 21 to 9, in order to ensure an equal range for both beams. Green light is not used as a main feature in any lighthouse. But there is an important service performed by coloured lights, reference to which must not be omitted. It will be understood that the main light is intended to do what may be called distant work, it lifts its head high, reaches

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out across the waters as far as the horizon, and, we may fancy, strives to look over and beyond the earth's curve, so as to catch the eye of any far off struggling mariner who may need its guiding light. Having then this important duty to fulfil there is some difficulty in making it applicable for giving special warnings and guides as regards the neighbourhood close at hand. Accordingly it is the practice at many places to throw from the lighthouse a subsidiary light of a special character so as to cover any rocks or shoals in the neighbourhood, by means of which sailors, on seeing this special light, will know that they are in danger, and by its bearing will be assisted in shaping a course of safety. Neither long ranges nor powerful lights are required in these cases, and there is consequently less objection to the employment of coloured light. The portions of light appropriated for this purpose are generally given a special character by means of colour, and are called sectors, the object being practically achieved by simply causing the light which goes out in the direction of the dangers requiring to be specially indicated to be intercepted in the lantern by a vertical strip of coloured glass. Red is the colour mostly employed, but it is plain that any kind of sector differing from the character of the main light will be applicable. A remarkable exemplification of this method is in operation at the Coquet Island lighthouse off the coast of Northumberland. The surrounding sea is divided into eight irregular areas, each area being marked in a distinct manner, the main or seaward area being of course the largest, having an illuminated arc of 180°, the other areas being very much smaller in extent. The diversity of characteristics is aided by a lower light in the same tower 28 feet below the main light.

The sailing directions and charts for the various parts of the coast instruct the mariner how to make use of the lights as guiding or warning marks after he has identified them. In conjunction with compass bearings he knows that when he sees two lights in line, that is one exactly behind the other, he will be on the line leading him through a certain channel.* He can also ascertain his distance

* It is well to note that two lights in line seen by the unaided eye sometimes appear as one light only, but on being looked at through binocular glasses will open out as two lights.

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from the land by taking two bearings of a light, and he also knows that if he keeps a certain light on a certain line of bearing, having previously assured himself of his distance from land, he can safely keep his course for a certain period, until by other conjunctions he is informed when to alter his course and get the light on another bearing, &c. These are details which it is the business of a mariner to be thoroughly familiar with, and are merely roughly indicated here with the object of conveying to non-professional readers a general idea concerning the manner in which lights are made practically serviceable.

(*To be continued.*)

A FEW REMARKS ON THE NAVIGATION OF PASSENGER SHIPS.

ON the great heaving sea of literature a few years ago a small voice came to the surface with many complaints against nearly everybody who had anything to do with ships; it then suddenly disappeared, went to that bourne probably, or to that basket, from which, even for small literary voices, there is no return.

It charged captains and officers particularly with much "ignorance and carelessness," and in respect to the loss of first-class ships, roundly denounced them as men who, in the matter of nautical education, were "thoroughly incapable."[1]

Whether this free-lance of literature, this "Portuguese man-of-war," so to speak, addressed itself to the sailors, or to the ship-owners, is not clearly remembered, but to whomsoever addressed, its upbraidings do not appear to have reached many of them, for, according to tables of loss lately published, there appears to be but little diminution. That "ignorance and carelessness" have much to answer for in such losses there cannot be much doubt, but that the captains are in all cases to blame, is not quite so clear, for assuredly there are many grain ships which founder, and

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which when once they have left port and got into bad weather, are probably beyond all nautical skill. Still, it is a lamentable fact that our sailors have at times been tried, and, in many cases, been found wanting.

The Wreck Enquiry Court reads some of the unfortunate culprits a lesson which they at least do not forget; but it is very doubtful if the penalty which that authority inflicts, has much effect in diminishing shipwrecks. There are probably few men who do not believe that just previous to an accident they had done all that care and duty demanded; it is not till after the accident, or till after the enquiry, when in taking a clearer insight into their conduct, they can then see that there has been a lack of due care and caution.

After all has been said and done, sailors are doubtless a careless race of men; it is a result of their sea education, their absolute indifference to danger. But in these days of careful sober trade; in these days of "kettles and hot water," this once valuable quality has a tendency to bring our friend into trouble, and to tarnish a splendid reputation.

The Government of five-and-twenty years ago made an attempt to improve our sea officers in the three R's of seamanship. Though a wild youth, he had been long enough at school to pick up a "fair to middling" education, which, however, on getting to sea, had fallen back before the onslaught of the pipe and song. It is true he could read, and he could write, but—unlike a certain eminent statesman—he was not "death on figgers," so upon a few figures this paternal Government determined to trot him out.

Doubtless, figures will do a great deal for the sailor, but there is one desideratum they will not accomplish, and that is, to *improve the system* upon which his ship is navigated. That the system is bad, and capable of much improvement, take a trip or two in some of our finest passenger steamers, and be convinced without a shadow of doubt, that it is, at times, a very lame, impotent process, for a "floating palace" with a thousand precious human lives on board, and with a cargo valued at a hundred thousand pounds in her capacious hold.

In these days of "higher education" one might naturally

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expect to find in all our large steamers, a system second to none afloat, and the captain and officers as precise in such a duty as daily fixing the ship's position, and in her general navigation, as the most rigid critic could demand. A voyage or two, however, in some ships, and a few conversations with some officers, will probably dispel such an idea.

It may, perhaps, be desirable to point out what such arrangements *should* be, and also what they are. First, the ship should have a chart-room used for no other purpose than her navigation —the practice of the captain using it for a sleeping cabin, after letting his own room, is objectionable for many reasons.

In this chart-room, the charts, chronometers, and all instruments should be kept, to which the officer on duty should have ready access. When near the land the chart should be laid open on the table, and before the officer leaves the deck he should lay off her true position relative to the land, which the relieving officer should carefully understand before fully taking charge. This should be required of them by the directors, and the captain should see to it.

The custom of giving the officers a chronometer to keep in their sleeping cabins, so as not to bother the captain's little smoking parties in the chart-room, is a very bad practice, for it will be found that it is then occasionally wound up by the mess-room servant after a somewhat rough scrutiny. All such delicate instruments should be kept in the chart-room, handy for taking time, and under such treatment as is recommended by—say, the Admiralty. Not the captain, but a special officer should attend to them, for the simple reason that if any irregularity occurs, the former in his supervision soon discovers it, but over *him* there is no control.

For the same reason, the same officer should—as the captain's deputy—make the navigation his special study, independently of his regular watch on the bridge, but not so as to exclude the captain and chief officer from obtaining observations at every opportunity.

As the chief officer has the internal affairs of the ship to attend to, the navigating officer should be the second, who is invariably a passed master. He has charge of compasses as well as chrono-

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meters, and carefully records their errors and rates in a book always kept in the chart-room for reference. There are other innumerable duties which are supposed to appertain to the captain, but which this officer could very well attend to during his hours of duty. The custom of keeping separate and private notes of errors of compasses or chronometers leads to confusion; there should be a special book for that purpose kept by this officer—under the captain's direction—and to which all should have access.

If the captain be wise he employs this officer as his secretary, and they should work out their observations side by side in the chart-room, to which no passenger should have access. That such a secretary is necessary—particularly for vessels which travel at the rate of sixteen to eighteen miles an hour in the vicinity of land—is well known by those who are acquainted with chart-room secrets.

Commanders who have been accustomed to such a system, as officers, are generally its strongest advocates; and those who have not, invariably display the bitterest opposition to it, for reasons best known to themselves.

Whether they think that it detracts from their importance in the eyes of curious and verdant passengers, or that it may lower them in the opinion of their officers, by having an occasional error exposed, should be a matter of indifference to all managers of large companies, who should insist that the chart-room should be used as *an office*, in which to conduct the daily business of the ship, and not as a lounging place for favoured passengers.

The system of "watch and watch" is a bad one. It stands to reason that a man who has only been asleep three hours-and-a-half, who went to bed at half-past twelve, after keeping a four-hours' watch, and who is roused out again at 4 a.m. to keep another four-hours' watch, must suffer from fatigue both of mind and body. At 8 a.m., having had insufficient rest during the night, he goes again to bed.

In the old sailing ships—and, indeed, in the present ones, though not in the best of them—this is still the custom, but it is much less wearing work than on the narrow bridge of a steamer.

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A walk every four hours night and day without intermission, in a pleasant country, but in a plot of ground 4 feet by 40, would come to be very trying after a ten days' trial—particularly if continued for twenty years, but this would be *heavenly employment* compared with the constant watch on the narrow, confined bridge of some of our steamers, facing a head wind, and frequently a gale, with rain, fog, and blinding snow, to say nothing about the anxiety of running into another ship, or an iceberg, with all its horrible consequences. In the old sailing ships there was not this necessity for such a vigilant watch; many of them navigated through fairer and more pleasant regions, and were frequently becalmed, or moving so slowly that it was usual not only for the officer to leave his station on the quarter-deck, and amuse his mind with the ordinary duties of the ship, but to pass in and out of his cabin working up the reckoning, or indulging in "a smoke," or amusing himself in a hundred different ways with little duties pertaining to his ship, and thus giving healthy employment to mind and body.

The constant watch upon the steamer's bridge under such circumstances as do exist most assuredly narrows the mind and clouds the faculties. The time which a chief or second officer *wastes* there, should be employed by the one in attending to the domestic economy of his ship, and by the other, in carefully watching and recording her progress, by observing, when opportunity offers, altitudes of sun, moon, or stars, and by attending to his various compasses and instruments, which will keep him fully employed. The system in force in the Atlantic steamers is this *barbarous* "watch and watch." As a rule they carry four officers, who are invariably "passed" masters, the third and the fourth being quite as competent, probably, as the chief and second.

In the neighbourhood of land the watch of course cannot be too vigilant, although "lead" may be, and indeed is, far superior to "look-out." But after the ship has left the land and got out into open water, the time of the two principal officers should be employed more profitably than in "loafing" about the bridge—for it amounts to that, after a couple of hours walking. During bad, or foggy weather, the watch may be doubled, but it

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is not always foggy, and in fair weather, the two superior officers are, while on the bridge, actually of no more value to the ship than "look-out men." There is no reason whatever why what is known as the "three watch" system should not be that under which such valuable ships should be navigated. After clearing the land, the chief officer remains on deck all day, to attend to the thousand and one duties which, in a well regulated ship, should employ him. He and the fourth officer come on deck at 4 a.m. At daylight, in fine weather, he leaves the latter in charge of the upper bridge, and takes a general look round the ship—obtaining if possible observations for compasses and for longitude.

At 8 a.m. the third officer takes the bridge. The second also coming on deck to take observations, wind up chronometers, and for various other duties connected with navigation. For example, if the sun has not appeared to the chief officer, there is another all ready, instrument in hand, to take advantage of his appearance. At noon the fourth officer takes the bridge, and the chief, second, and third, work out the ship's position and pass the results into the chart-room to the captain. At 1 p.m., after dinner, the second takes the bridge and keeps it till 4 p.m., when he is relieved by the fourth, although it is actually the chief's watch, who, if the weather be bad, keeps it, and who, in any case, is up there before dark and remains till 8 p.m., when the third relieves him, and keeps to 12, and who is in his turn, relieved by the second, who keeps to 4 a.m., when the chief and fourth again come on deck.

By this system the chief has time to look after his ship, and the second to attend to his navigating duties, while the third and fourth are employed to some purpose, and not carried about simply as "stand-bys."

In the "watch and watch" system the chief and third, and the second and fourth are in company respectively.

The senior is supposed to walk about simply keeping a "look-out," and the junior attends to the steering, which is done by a quartermaster. There is no reason whatever why the standard compass should not be on the bridge proper, where the officer on

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the "look-out" or in charge of the ship could also attend to the steering, and this duty could be done quite as well by the junior, leaving the other free to attend to the manifold duties which large passenger steamers render necessary and which, it is well known to seamen, the captain, who has his passengers to entertain, cannot always attend to thoroughly.

Under the present system, there is a tendency for officers to drift into a condition little superior, in point of navigating abilities, to that of the only mate of a small coaster, who works up his reckoning by the aid of a piece of chalk; and *when* entrusted with a command, to navigate by the "rule of thumb." It is not very long ago since the chief officer of one of our great passenger steamers, on his ship being laid up, obtained command of a small barque. On arriving at his destination, after a very long passage, he called on board a mail steamer with his chronometer and requested permission to compare rates. He was shown into the chart-room, and the best chronometer with its various rates placed before him. As he appeared to be a little perplexed, the officer left him, saying he would call in again, and excused himself on the plea of some duty. On looking in, in the course of twenty minutes, the captain was still as far away from his desires as ever, and finally confessed that he was quite out of practice, and requested to be shown *how to compare the rates;* or in other words, granting the steamer's watch to be right by Greenwich, to find out how much his was wrong.

It may perhaps be remembered by some that during an inquiry into the circumstances of a collision in which a large steamer figured conspicuously, the judge expressed his astonishment that a senior officer could not lay down on the chart the ship's position by bearings given.

Yet such ignorance is easily accounted for; this officer had probably never laid down a position for years; probably, *very* probably, his navigating outfit had not a further range than an old wrinkled chart—occasionally by accident used for a pillow—a short piece of lead pencil, handy for the vest pocket, and a few blank leaves out of a cargo book, or a discarded paper collar.

Sea officers are like all other men, they get rusty without

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exercise, and they should be required to keep themselves up to the mark in the three R.'s of seamanship, instead of being foolishly compelled to beat about the bridge with an endless, meaningless object.

If an officer is going to be used merely as a "look-out" man, it matters not what his antecedents may have been, he will, before very long, simply yield as much as a "look-out" man; but if, by a judicious system, he be used as an intelligent and experienced officer, who shall be thoroughly conversant with everything pertaining to the vessel's safety, such, for example, as her position with respect to a point of land on his relieving the bridge, and the same, hour by hour, as she advances, captains may then go down to dinner, or to sleep in their chart-rooms, with the assurance that there is an officer on the bridge who knows what he is about, and who will not suffer his vessel to run so far towards the land till the black pinnacles of the reefs may be seen close under the bows.

The object, then, of the three watch system, is to give the officers time enough to attend to the manifold duties which should be demanded from them when the vessel is at sea, in open water, a sort of rehearsal of the parts which shall be expected when their ship approaches the land, and which they should be able to carry out with judgment, promptitude, and skill. In the vicinity of land or in fog, double the watches by all means, but when clear of the land, and in fair weather, let the senior devote some of his time to the higher branches of his duties, and let it be done in the chart-room under the captain's eye, and in what is really the ship's office.

Let the chief officer look after the internal affairs of his ship more than is customary; the practice of telling off the purser to look after the steerages, is a mistake which has caused no end of trouble and discomfort to the passengers in that department, for it is well known that the purser is a carpet knight who passes his time between the smoking-room, his own office, and the ladies' saloon, and is occasionally on such terms with the captain, that should anything wrong be observed, the latter officer would probably choose to pass it over, or to depute one of his deck officers to attend to it. Even should the purser look

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carefully after this part of the ship, if he wants anything done for the steerage passengers, he frequently has to apply to the chief officer, who is not always disposed to accommodate him; at least, in *any* particular way which he requires. At the usual hour of inspection, say 10.30 a.m., the party should be composed of the captain, chief officer, surgeon, and chief steward *or* purser; but in too many cases, the chief officer is either on the bridge, or in bed fast asleep, instead of being near the captain to witness and to correct many of the irregularities which must habitually occur on board of a ship suddenly crowded with 1,000 people, and with a crew, which in so many cases, are all strangers to the ship, and to the duties expected of them.

It may be argued that in those steamers where the three watch system has been working for some years, there is a greater percentage of loss than in the Atlantic ships; which, as a simple fact, may be the case; but it must be remembered that those vessels, running to India, China, Brazils, or to Australia, navigate a very much more dangerous route; certainly they are much oftener near the land, which appears to be *the* great danger.

But the object of this argument is not to establish the system *for itself alone;* it is to give the officers more time for those higher attainments of knowledge, without which, their high class diplomas are valueless; and their presence on the bridge, a "delusion and a snare."

In things connected with figures there is no man who so readily gets out of practice as a sailor; and how can we wonder at the dreadful losses which so frequently occur, when some of the officers, *from whom the captains are drawn,* neither know how to lay off a bearing, nor to correct the rate of their chronometers. These duties can be, and are in many cases, as often neglected under one system as under the other; but under that which is deprecated there is certainly more excuse for such ignorance.

When we come to think how much there is at stake; and how by the least error of judgment, or the misplacing of a figure, all the horrors of a dreadful shipwreck may be in a moment brought about, it is astonishing that directors should leave such serious matters in the hands of the captain; for it can be understood that if he

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advocated a check upon his work, it might be taken as implying a doubt of his own ability or judgment. There are such factors as pride or vanity which occasionally influence men against their better judgment; and they are to be found upon the quarter-deck as well as upon *terra firma;* but the "one man power" system—with five or six passed masters on board—is very sweet as long as everything is *couleur de rose.*

There is no reason, whatever, why our mammoth ships should not carry six officers, and thus be able to establish the three watch system as a permanency, with two in each watch. The cost of two extra officers would be nothing compared to the increased security of the ship.

But all the care of directors in selecting high-class officers, and plenty of them; all the wisdom expended in the construction of their ships—leaving out the bulkheads, which are called "*water-tight*"—all the money, in short, which is lavished upon their splendid fleets, together with cargoes and thousands of human lives, is liable at any moment to be cast to the bottom of the sea, by the false step, or the least error of one single individual, who may be guilty of some of the negligences or ignorances to which reference has been made. It is earnestly hoped that these remarks may reach some of those.

E. B.

COAST DEFENCES.

IN this series of articles we must not pass over without remark one of the most important factors in connection with the Navy education. In the last generation it was at low water mark, and the following anecdote not inaptly represents its true state and in some measure that which succeeded it. The surrender of the great Napoleon was first made known to the English fleet by a French squadron standing boldly into Plymouth Sound, and sending an officer on board the flag-ship; he could not speak English, and no officer could be found conversant with French. After much time had

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been lost, a ship's schoolmaster was brought forward, who having been a prisoner of war had mastered the language. With a few brilliant exceptions but little advance was made in science or languages until quite recent times, the old fashioned gunnery did not require the simplest knowledge of mathematics to enable the seaman to become a proficient in its vocabulary; steam had not made much progress, and surveying was almost wholly in the hands as it is now in a great measure, of the navigating class.

The Admiralty of the day so far from encouraging officers to master the scientific part of their noble profession essayed to strangle any attempt at enquiry. To publish a professional article was a crime, and possibly the clause forbidding it may not yet be expunged from the regulations. If officers are debarred from writing on what they love, how can they keep pace with the times when restless brains are ever at work formulating new ideas. Let anyone interested in the subject run his finger down the long list of inventions of the present age, and point out the improvements in steam, gunnery, electricity, or torpedoes that have emanated from the brains of naval officers. The first-named was actually tabooed as an agent for saving manual labour, and to this day our men-of-war are generally pulled about by huge hawsers of Russian hemp, in lieu of by manilla lines and steam winches. High and low pressure cylinders are due to Randolph and Elder, and a hard fight it was before they were allowed in the service. Torpedoes are the creations of outsiders, although had thought been encouraged in lieu of repressed, some of the able men who witnessed the effects of the crude attempts of the Russians during the Crimean War would certainly have made progress in a science, which now is probably only in its infancy.

However, the time arrived when it became absolutely necessary to introduce a higher system of education, and a scheme of which a copy is annexed, was floated for the benefit of the present and future generations. Could the programme be carried out in its entirety, the royal road to learning may be said to have been discovered, and the plodding youths of England might safely take a leaf from the Admiralty book.

The following paragraphs will give the outline of this scheme.

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It is to be opened to captains, commanders, lieutenants, navigating officers, naval instructors, acting sub-lieutenants, and acting navigating sub-lieutenants, officers of the Royal Marine Artillery, and light infantry engineers, dockyard apprentices, private students of naval or marine architecture, and officers of the mercantile marine.

The term for study will commence on October 1 in each year, and will terminate on June 30 following. Under special circumstances, an officer may have the advantage of two terms to acquire a knowledge of the following list of sciences and languages—viz.:—

1. Pure mathematics, including Co-Ordinates and Higher Pure Geometry, Differential and Integral Calculus, Finite Differences, and the Calculus of Variations.

2. Applied Mathematics—viz., Kinematics, Mechanics, Optics, and the Theories of Sound, Light, Heat, Electricity, and Magnetism.

3. Applied Mechanics, including the Theory of Structures, the Principles of Mechanics, and the Theory of Machines.

4. Nautical Astronomy, Surveying, Hydrography, with Maritime Geography, Meteorology, and Chart Drawing.

5. Experimental Sciences.

   a. Physics—viz., Sound, Heat, Light, Electricity, and Magnetism.

   b. Chemistry.

   c. Metallurgy.

6. Marine Engineering in all its branches.

7. Naval Architecture in all its branches.

8. Fortification, Military Drawing, and Naval Artillery.

9. International and Maritime Law; Law of Evidence and Naval Courts-Martial.

10. Naval History and Tactics, including Naval Signals and Steam Evolutions.

11. Modern Languages.

12. Drawing.

13. Hygiene—Naval and Climatic.

To thoroughly master any particular branch of science herein mentioned would require years of close application. Take, for

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example, Naval architecture or marine engineering, it is not too much to assert that any one who could even in two terms make himself reasonably well acquainted with either must possess abilities beyond the ordinary run of mankind. The wranglers of Oxford or Cambridge could not have acquired such multifarious knowledge in so short a period of time as is here mentioned, and yet men untrained, in many instance, to studies of any description, and who must frequently have attained middle age before commencing them, are supposed to be equal to it. We can easily fancy the bewilderment of some veteran, whose thoughts had for years been centred on the ordinary duties of his profession, as he scans the formidable array of science before him. A man looking for the first time on the machinery of some great factory could scarcely feel more bewildered than he must at the sight of this formidable list.

During many years, the various hydrographers of the Admiralty have strained every nerve to induce officers of the senior executive line to enter the surveying service, with what success let the present list of assistants at the Hydrographical Office testify. The duties are interesting to any one who has a love for study, and carry the higher recommendation of double pay, which, in a poor profession, cannot fail to have great weight amongst its members. From such facts we learn that the most tempting offers have fallen unheeded on the ears of English officers, although the amount of knowledge required for the ordinary duties of a surveying officer are not onerous, a common knowledge of nautical astronomy, drawing, and good penmanship, being the great essentials. Whence, then, comes this reluctance to study, and how is such a glaring defect to be remedied? The answer to the first part of the question is easy, and may be comprised in two words—doubtful training. This commences from the first entry into the *Britannia*. By this we do not mean to infer that the Naval instructors do not in every way most conscientiously carry out their instructions. On the contrary, in former years, we had the pleasure of the acquaintance of two of these gentlemen, and can, therefore, bear testimony to their high ability, to the interest they take in their pupils, and to their general fitness in every particular for the important post they hold. The

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fault arises from the fact that the moment a youth enters the School-ship, he ceases to look on himself as a boy, and is at once, in his own imagination, elevated to the rank of an officer in Her Majesty's service—one born to command. His letters are addressed Esquire, and R.N., and watermen or small tradesmen salute him as he passes. If he happens to have a liberal allowance, and is generous, the servants and old salts carefully nurse this conceit, and learning becomes a bore after he has acquired the small amount necessary to pull through an indifferent or even a good examination.

It has often been a subject of comment amongst officers that the cadets from the *Britannia* are not in advance of those of former years; and one has but to examine a *Navy List* to see the correctness of this assertion. In one now at hand we find that, out of eighteen sub-lieutenants on the first page, only five have a first-class certificate for seamanship, and the whole have a second or third for gunnery, navigation, and astronomy; and on the second page, out of forty-four, nine have a first-class for seamanship, and with four exceptions, a second or third for the remaining qualifications.

On the third page, out of forty-four, twelve have a first for seamanship, four for gunnery, and a second or third for the remainder —generally the latter.

On the fourth page, out of forty-four, twenty-four have a first-class for seamanship, three for gunnery, and a second or third for the other branches.

It is useless to quote from any more pages in the list, as the average does not exceed the number in the first four pages.

The examination for seamanship is always *viva voce;* and, as the majority of the questions can readily be learned from Boyd's or Nares' useful books, it is surprising that such a small number of candidates only succeed in obtaining a first.

The throwing of cold water on the efforts of the few workers for literary distinction, effectually debars the majority from attempting to improve their general knowledge, and the results are occasionally most lamentable.

A short time since, the writer of this article was at a dinner-

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party given to the officers of a German ship-of-war. It is superfluous to add that the conversation was carried on almost entirely in English. An English Naval officer was endeavouring to prove to a German that our working men were too highly educated for their position in life, hence the strikes and discontent which so widely prevailed throughout the country. He wound up by adding emphatically, "If you wish your soldiers and sailors to serve you well, do not educate them beyond simple reading and writing." Although the other laboured under the disadvantage of speaking in a foreign language, his arguments in favour of a higher standard of education for the poor were so convincing that he quickly silenced his antagonist. The last war between France and Germany strongly illustrates the extraordinary power an educated people possess to carry on a great struggle. Ignorance and conceit ruined France. Her soldiers were brought up with the idea that each was naturally a soldier, who required no book-learning to nurture his great abilities. An unparalleled series of reverses convinced the world they were not equal on the field of battle to their more intellectual neighbours. The intellectual man has resources of which the ignorant have no knowledge, and they tell with greater weight in reverses than in success. It should always be borne in mind that the results of a defeat in the present day cannot be estimated by the history of any former war. There is no time to recover from a disaster; steam, vast wealth, the electric telegraph, and railways, all lend their aid to enable the able general to carry out his plans successfully. On the other hand, failing to understand thoroughly the use of such aids would sacrifice many of the advantages which might be gained by their use.

It is too much the custom to undervalue good seamanship, and to infer that the engineer and the marine artilleryman are to fight our future battles on the sea. Such an opinion is not only erroneous, but dangerous. Never in the history of Naval warfare was the skilful handling of a ship so necessary as at present; a single mistake may be fatal. To acquire the necessary knowledge, a theoretical as well as a practical education is absolutely necessary, and the officer who combines both in the highest degree of excel-

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lence is the man to be entrusted with the safety and honour of his country. England's motto should be, "No other need apply."

It appears that few have fairly counted the cost of a great Naval reverse, and the majority of Englishmen cannot form an idea of the consequences. A defeated army may be reorganised, but a Navy cannot in a short period regain its lost prestige or protect its seaboard. Apart from this is the ominous fact that an invasion would not be such a chimerical idea as many imagine if the command of the sea were to pass into other hands, and it should never be forgotten that from the Roman to the Norman all have been successful. It may or may not be that a similar result would follow a modern attempt to conquer these islands. It is our duty, however, to place ourselves in such a position, that no combination of foreign navies would dare to try it, for the mere attempt must prove most damaging to our reputation.

For the present we may dismiss all idea of a French invasion, but it is idle to think that Germany is not jealous of our commercial superiority, and sensible of our weakness as a military power. They truly said that if England had cast in her lot with France the result would not have been different. They are perfectly aware that our safety lies in the strength of the fleet. Could the North Sea be bridged, the volunteers of England would go down before their well-disciplined legions. Stern necessity has made every German a soldier, and the rich cities of England do occasionally form a subject of conversation in their camp. In fact, they only want a numerous marine to be ready to make us feel their power, as a cause for a quarrel is always at hand, were it only the possession of the small island of Heligoland at the mouth of the Elbe. During the last war it formed a convenient rendezvous for the French fleet, and England can scarcely affect surprise to hear that strong opinions are hinted regarding its future sovereignty by all classes of Germans. So long as we hold it, the maritime commerce of the richest provinces of their country is entirely in our power during war. From that retreat the Elbe might be as easily blockaded as the Baltic provinces were during the campaigns of 1854-5.

As it is with the officers so must it be with the seamen. The

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time whether rightly or wrongly, has passed when any class may be ruled by fear, and the result naturally follows that it can only be effected by education on their part and an immense amount of tact on the side of the officers. The present is probably one of the most critical periods in Naval history, as far as discipline is concerned. Old landmarks which have been standing for years are swept away and cannot be rebuilt, without their place being securely occupied by those which in due time must follow. For a brief space the feeling of dread which the shadow of the cat always engendered will give place in certain individuals to a species of lawlessness. Where this prevails, it should be at once suppressed with all the force the law has substituted for a punishment which modern civilization will only tolerate in the case of the garrotter. It is doubtful if the character of any particular body of men has altered so much within the memory of a generation not yet old, as that of the British seamen. Thirty years since his ship was the object of his special veneration and love. Her profile by some cunning hand was tattooed on his shaggy chest or worked in worsted with his brawny fingers, and hung up on the lower deck for his shipmates and visitors to envy or admire. To have his clothes cut out or fashioned by a tailor, would have been looked on as a disgrace, and the embroidery on frock or trousers excited the admiration of connoisseurs in needle-work. In exercises aloft or during trials of sailing, he not only worked with a fierce energy that required no spurring to keep him up to the mark, but recklessly risked, and alas! only too often sacrificed his life in attempting to make the frigate distinguished beyond her competitors. To such an excess was this rivalry carried that it was not in some cases safe to allow the crews of rival ships to have leave at the same time. Pitched battles were not uncommon in the rope walk at Malta, or in other purlieus well-known to the seamen of the day. It is not to be regretted that these sanguinary contests are ended, still it is impossible not to admire the spirit which prompted them. There is little fear of modern crews making the beauties of the *Devastation* or the *Polyphemus*, a cause of belligerency, however zealous they may be of upholding the good qualities of either of the mis-shapen monsters. Be that as it may, English men-

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of-war's-men will always be ready to uphold the honour of their flag, notwithstanding that steam has annihilated the romance which for generations has been attached to their profession. The care now taken to train new entries is highly praiseworthy, yet it is a subject for regret that the young muscular seamen of the merchant service cannot be induced to join the Queen's ships. Such a course would infuse new blood into the present system of manning, bring the services more in harmony with each other, and save the State the expenses appertaining to many years of instruction. Under the present benevolent *régime* it is to many difficult to understand the cause of the reluctance to enter a service which possesses so many substantial advantages over its rival. But those who are intimately acquainted with the working of both are practically behind the scenes, and attribute it to the memory of cruelties that seem almost incredible to those who have not studied the history of the Navy from the time of the revolutionary war. The cause has been removed, the scars still remain, just as we may at this moment witness the effects of centuries of misgovernment in Ireland. Yet these were the good old times sentimentalists affect to regret so deeply, and which even now are often held up as an example worthy of being imitated by the present generation. So late as 1831, a lieutenant commanding what were then named blockade stations (Coastguard now) dare not go out of sight of his house without the written permission of the Inspecting Commander of the district, and to be detected wearing plain clothes in a walk to a neighbouring village was a crime warranting a Court of Enquiry. Until a few right minded men ventured to depart from the rules laid down by their predecessors, by allowing their crews the privilege of going on leave like rational beings, ships companies seldom set foot on shore more than once a quarter. The results were exactly what might have been expected, scenes of violence, drunkenness and debauchery turned the noisome purlieus of our great naval stations into Saturnalias of the worst description. The ships' police acquired a small fortune by the apprehension of deserters, and long afterwards punishments of various degrees of rigour testified to the demoralized condition of men who had irretrievably lost all self

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respect, and to the lamentable ignorance of human nature and want of tact on the part of commanding officers.

This portion of a rather long article is drawing to a close. Possibly at some future time the defence of the colonies may be taken up in order to point out the weak links in the vaunted chain, "girdling the earth on which the drummers stand who successively take up the reveillé at sunrise." There is but little fear of the connection being broken so long as England remains the England of former days. But great as she unquestionably is, her prestige has recently sustained some severe shocks, and it is needless to add that a repetition will lead to troublesome if not dangerous consequences. The nations of the continent exist by the aid of big battalions, we, in a very great measure, on prestige, which useful as it is, like the law, falls into contempt if physical force is not at hand to maintain it.

At the dinner of the Guild of Shipwrights, a well-earned compliment was paid to the talented Constructor of the Navy, Mr. N. Burnaby, C.B., and his able assistants, for the skill and science they had displayed in the construction of recent ships. It is not advancing too much to state that if officers who are responsible for the honour of the Navy will only point out the particular type of ship they require, it will, under the united efforts of these gentlemen, be perfected. At the risk of trenching on a repetition of what has already been written, it must again be asserted that there is not "a cruizer to protect commerce" on the Navy List competent in winter to cross the Atlantic in any definite time; we boast of having three-fourths of the carrying trade of the world, and are unable to turn out a ship competent to defend it from an enemy. If this defect is not remedied, and a "station bill" formulated, England on the sudden outbreak of a war will resemble a merchant ship towed from dock to sea with an undisciplined crew, unknown to each other and to their officers, to work her off a dangerous lee-shore in the teeth of a gale.

Since this article was sent to the printer an officer's report of the German Navy has been published. It comprises seven armoured frigates, five armoured corvettes, twelve unarmoured spar-deck corvettes, ten flushed-deck corvettes, five gunboats of

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the first-class, one armoured battery, thirteen armoured gunboats, four torpedo boats, four mine layers, three gunboats of the second-class, eight despatch vessels, a transport, eleven training and school ships, eleven ships for harbour service, and eight pilot boats, not a bad show for a power which has not a single colony to protect. One cannot forbear being struck by the very large number of training ships in this list; it demonstrates that the Teuton has grasped the fact that education on the ocean will in the future become as great an element of power as it is on the land. It is certain that German officers and German seamen are not inferior to our own in practical knowledge, and even less in theoretical subjects and accomplishments. The writer has had great experience of the conduct and qualifications of both, and regrets to add that man for man he prefers the German sailor to his own countryman. They are at all times sober, cleanly, patient, and industrious, rarely giving the slightest trouble to their officers, or misbehaving on shore. Such qualities are invaluable in all classes, especially so with seamen, and indicate unmistakably that England must look to her laurels in peace or war when this people are her opponents. W.

THE DESTRUCTION OF CALF ROCK LIGHTHOUSE.

IT is fortunately seldom that any serious disaster in connection with the Lighthouse Service of the United Kingdom has to be recorded, which fact is a silent testimony to the efficiency and permanence of the general arrangements for the marking of our coasts. It is therefore not without a feeling of pain that we have to refer to the recent accident at the lighthouse on the Calf Rock, near Bearhaven, on the south-west coast of Ireland. This lighthouse was completed in 1866; the tower was of cast iron, lined with brick, 75 feet high, and 21 feet diameter at the base. In January, 1869, a very severe storm took place, during which a portion of

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the lantern gallery was carried away. Upon this warning as to the exceptionally heavy seas which break on the rock, it was thought desirable, after professional inspection, to strengthen the tower for half its height with an external casing of cast iron, the space between the old and new casings to be filled in with concrete, thereby increasing the diameter to 30 feet at the base, and to reduce the overhanging lip of the gallery so as to offer less obstruction to the waves which might strike the tower. This work was duly carried out, and some small houses were erected on the rock for the protection and convenience of the keepers. Since that period, 1870, nothing alarming has occurred, although it is reported that the sea frequently broke with very great fury upon the rock, the waves at times running up and striking the upper part of the tower with tremendous force. Both this rock and the Fastnet to the south are exposed to the full strength of a S.W. gale, there being nothing whatever to break the force of the wind itself rushing across the vast expanse of the Atlantic, nor of the momentum of the waves established by the wind and which "come home" upon these rocks with indescribable violence. The catastrophe now to be recorded is that during a storm on the morning of the 27th November, the whole of the upper part of the tower above the new casing was carried away, the keepers having to run for their lives. Fortunately no life was lost, but as the men could not get off the rock, they were compelled to wait there during a long continuance of bad weather, it being impossible for a boat to get near the rock, and provisions having to be conveyed to them by various expedients. The men managed to obtain some shelter in the small houses already mentioned, but were in a condition of great peril. A change of wind and consequent quieting of the sea at length enabled the men to be taken off, after eleven days' imprisonment, during which they endured much exposure and hardship. With praiseworthy alacrity the Commissioners of Irish Lights have arranged for the exhibition of a light, similar in character to that extinguished, from Dursey Island, and not too soon can so valuable a light be replaced, for no one knows what further disasters may result from its absence. As regards the

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cause of the giving way of the tower in connection with its design and construction, no opinion can at present be formed, but no doubt the matter will be fully investigated in order that the defect, if any, may be brought to light, and a recurrence of such a catastrophe prevented.

BRITISH NORTH BORNEO COMPANY.

THE large island of Borneo, situated on both sides of the equator, extending 778 English miles north and south, and 724 miles east and west, with an estimated area of 289,000 square miles, occupies a commanding position in the Eastern Archipelago, and yet little is really known of the physical features, productions, and inhabitants of its vast interior. Parts even of its coast line are not accurately delineated. By treaty with the native chiefs in the middle of the last century the old East India Company acquired proprietary rights in the northern part of the island, but no establishments were settled or any attempts made to develop the resources and trade of the district. The Dutch include fully two-thirds of Borneo as being within their Eastern possessions, but information from that source always oozes out slowly. More interest than heretofore was, however, taken in the island subsequent to the time when Sir James Brooke became Rajah of Sarawak (1841), and by his routing out piracy from the rivers of the north-west coast. Since that date several travellers have traversed Borneo in different directions, and added something to our former scanty modicum of knowledge. Several unconnected lofty ridges of mountains traverse the island from north to south within its western side, and others trend from these towards the east and south-east, some of them enclosing extensive lowlands, through the midst of which flow large rivers towards the coast; and the junction of some of these rivers within the flat area during the rainy season produces temporary lakes of large size. The highest point of Borneo is near the northern end; it attains an elevation of 13,700 feet, and

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is known as Kini Balu, or the "Chinese Widow." The great lake in this vicinity that has hitherto been marked on maps is supposed to have no existence, being merely the natural overflow of several rivers on a plain during and after the rains. Equally remarkable are the dense forests and rapid growth of vegetation, the abundance of animal life, and the mineral wealth which includes the precious metals and good coal. The whole island, away from the coast, has been characterised as one huge primeval forest.

The population, which is taken to be about two millions, includes Dyaks, Malays, Kyans, Papuas or Negritos, Chinese, Sulus, and Bajows or Bugis (from Celebes). The Dyaks are the most numerous, and consist of many tribes, but the observations of recent travellers appear to indicate that there is great similarity between all the Dyak tribes, both in physical and mental characteristics; though there are many specialities of habits, there is a practical identity in their general character and habits, customs, ideas, and superstitions.

Borneo, cut by the equator, and extending through 11¼° of latitude, has a great diversity of seasons and of climate; the northern half is characterized by the N.E. and S.W. monsoons of the China Sea, and the southern half by the east and west monsoons of the Java sea. At the level of the sea the thermometer seldom falls below 80°, or rises above 90°.

The Dutch, through two residencies, rule over many tributary native states and rajahships comprised within the west and south coasts, and part of the east. Pontianak, at the mouth of the large river Kapuas, is the seat of the western residency; while Banjermassin, at the mouth of a system of large rivers, is the residency for the south and east coasts. Both are places of very large trade. The most important place on the east side of Borneo is Samarinda, the seat of government of the semi-independent Malay Sultan of Koti; this territory is watered by the Koti and Mahakkam, both large rivers, and navigable for a considerable distance. The present Sultan is keenly alive to the prosperity which accompanies trade, and is specially anxious to develop the resources of his country.

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The independent native states of Sarawak and Bruni are on the N.W. coast; beside which there is the northern part of Borneo to which we shall presently refer.

SARAWAK, a state on the N.W. coast of Borneo, has an area of about 35,000 square miles. The coast line extends S.W. to N.E. from Tanjong Datu to Kidorong point and bay, and the district trends inland to the distance of a 100 miles, or more in some parts, towards a mountain range running N.E. and S.W. It narrows considerably to the southward, where the mountains come closer to the coast, and among which are peaks that rise to an elevation of 4,000 to 6,000 feet: this part is still covered with the primeval forest. There are not less than eleven principal rivers in the Sarawak territory, and many of smaller importance. Most of the rivers have a bar at the entrance, and sandbanks within, but they are nevertheless navigable. The Sarawak river has two entrances, Santubong and Moratabas; and on it is situated the capital, Kuching, with a population of about 12,000 persons. But the Rejang, with its tributaries rising far in the interior, is the most important river in the state; after a rapid descent of a hundred miles or more, it becomes navigable near the bifurcation of Balleh for vessels of 7 to 9 feet draught, and for larger vessels towards the entrances; from Balleh to Kanowit it passes through an undulating country, when it branches off and forms a delta, the two main streams, Rejang and Egan, emptying into the sea about 60 miles apart. The Sarebas river was, before Rajah Brooke's time, famous for its pirates, but now peace and order prevail, and the people follow their daily avocations without fear of pirates at sea, or head-taking Dyaks ashore.

In reference to the prosperity and progress of Sarawak, Consul-General Ussher wrote as follows in 1877:—"It is not every government that, on a yearly revenue of £40,000 sterling, would be enabled effectively to rule 35,000 square miles of territory, with a population of 240,000 souls, to keep up a respectable standing military force, to garrison and maintain fourteen forts, to pay a competent staff of European officers and native authorities, to maintain three gunboats, to protect commerce and agriculture, and generally to guarantee safety to

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life and property within its limits. In the meantime the people appear to be generally contented and happy, and although there are defects to be found in the rule of Sarawak, they are such as require time to amend. Sarawak is not yet forty years old. Its power is based upon the remembrance of, and gratitude due to, the late Rajah Sir James Brooke, as well as upon the firm administration and even-handed justice of the present government."

The climate of Sarawak is considered to be sufficiently healthy for Europeans; though the annual rainfall ranges from 160 to 200 inches, it is salubrious notwithstanding its humidity.

BRUNI or BORNEO PROPER is an independent Malay state ruled by a native Sultan. Adjoining Sarawak, it extends along the N.W. coast of Borneo, from Kidorong point to Kimanis river and bay, and thence inland to the distance of 50 to 90 miles, to the north-western slope of the mountain range running to the S.W.-ward from the Kini Balu peak. Much of the country is low, and often so towards the coast; and though there are apparently many rivers within this area, the best known are the Barram, the Bruni, and the Kimanis, all of which are large. The Bruni river discharges into a bay on the northern border of which lies the island of Labuan; the town of Bruni and residence of the Sultan is near the mouth of the river. The Kimanis river forms the boundary of the territory ceded to the old East India Company in 1763, as well as the jurisdiction of the Sultan of Bruni. Many of the large rivers flow sweet to the sea, especially during and after the rainy season, and the Kimanis is one of them. In Sarawak and Bruni wherever there is trade, there are supplies to be had.

The LABUAN GROUP of islands, a dependency of Great Britain, lies close to the N.W. coast of Borneo, and opposite (north of) the entrance to Bruni river, in lat. 5° 18′ N. (centre). The group comprehends Labuan, Kuraman, Burong (Bird island), Rusukan Besar (Great Rusukan), Rusukan Kechil (Little Rusukan), Enöe, Pappan (or Coolin Pappan), and Daat.

Labuan, the largest of the group, is about ten miles long, and about five miles wide. The northern part is moderately high, and attains an elevation of 300 feet; here are the coal mines, and

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convenient anchorage for vessels of any draught may be found off Koubong bluff, where however a heavy sea tumbles in during the N.E. monsoon. The southern part of the island is marshy, or intersected by streams. Victoria harbour, on the S.E. side of Labuan, is sheltered in both monsoons. The other islands are very small.

The weather at Labuan is generally very fine; the land and sea breezes are seldom interrupted. A large quantity of rain falls annually, but this generally comes off the coast of Borneo in squalls, which most frequently occur between 8 p.m. and midnight, and blow heavily, especially in June and July. During the S.W. monsoon the land breeze, which usually commences with these squalls, lasts until 7 or 8 p.m., and is a steady fresh breeze, whilst in the N.E. monsoon it is light and variable, and if blowing hard in the China sea it is not felt at Labuan. The sea breeze in the S.W. monsoon commences at noon and lasts until 4 or 5 p.m; but in the N.E. monsoon it commences earlier and lasts until 7 or 8 p.m., hanging well to northward and blowing fresh. January, February, and March are the dry months. The atmosphere in Victoria harbour is often very oppressive.

We now reach the SABAH TERRITORY which comprehends the extreme northern part of Borneo, and which has recently passed into the hands of the British North Borneo Company. Acting Consul-General Treacher writing in 1879 says that the sovereignty of the district of Borneo to which his report relates is divided between the Sultans of Bruni and of Sulu, and he continues:—

"Borneo Proper, the kingdom of the Bruni Sultan, may be said to extend from Kidorong point to the Pandassan river, while the Sultan of Sulu would appear to be more or less recognised in the district from the Pandassan to Sibuco river, but the authority exercised by either potentate at any distance from the seat of government is of the slightest, and no revenue is derived from the remoter provinces. The limits here assigned do not, however, by any means coincide with the pretensions of either Sultan. The Sultan of Bruni, for instance, claims the sovereignty of the whole country up to the Sibuco river, and towards the close of 1877 leased his rights over the northern and north-eastern

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portion of Borneo to a British company for a considerable annual payment. On the other hand, the Sultan of Sulu maintains that the portion of Borneo tributary to him extends from the Kimanis river on the south, to south of the Sibuco river on the north-east of Borneo, and in 1878 the reigning Sultan ceded that district to the British. It is probable that at one time Borneo Proper extended as far south as Cape Kaniongan on the east coast, but the Sulus assert that during a rebellion at Bruni they afforded assistance to one of two rival aspirants to the throne and received a grant of Northern Borneo in reward for their services. The relations of the two governments have never since been friendly, and up to within the last 20 or 30 years, that is previous to the settlement of Labuan, Bruni and Sulu boats seldom met without an engagement in which the Sulus would appear to have most frequently carried off the honours."

BRITISH NORTH BORNEO COMPANY'S TERRITORY.—On the 29th day of December, 1877, the Sultan of Bruni, made to Alfred Dent and another, conjointly, their heirs, associates, successors, or assigns, three several grants of territories, lands, and islands, being certain portions of the dominions owned by the Sultan of Borneo and his chief minister, and "comprising the entire northern portion of the island of Borneo from the Sulaman river on the west coast of Maludu bay and to the river Paitan, and thence the entire eastern coast as far as the Sibuco river comprising the states of Paitan, Sugut, Bangaya, Labuk, Sandakan, Kina Batangan, and Mumiang, and other lands as far as Sibuco river, furthermore the provinces of Kimanis and Benoni, the province of Pappar, and the territory of Gaya bay and Sapangar bay, with all the land and islands belonging thereto within three marine leagues of the coast, and likewise the island of Banguey, for certain considerations," which appear to be a total sum of 15,000 dollars to be paid annually; and for which sum one of the grantees was also nominated and appointed by the Sultan, "supreme ruler of the above-named territories with the title of Maharajah of Sabah (North Borneo), and Rajah of Gaya and Sandakan, with power of life and death over the inhabitants, with all the absolute rights of property vested in the Sultan over the soil of the country, and the right to dispose of the same,

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as well as the rights over the productions of the country whether mineral, vegetable, or animal, with the rights of making laws, coining money, creating an army and navy, levying customs' rates on home and foreign trade, and shipping and other dues and taxes on the inhabitants, &c., &c.;"—in fact with sovereign rights transferable to a duly appointed successor.

But, as before stated, the authority of the Sultan of Bruni over the whole of this territory was not undisputed; the Sultan of Sulu claimed rights and privileges therein, and this being known, it appears that "on the 22nd day of January, 1878, the Sultan of Sulu and the dependencies thereof, ... made and issued to the same two persons, or one of them . . . . as representatives of a British Company . . . . a grant of his rights and powers over territories, lands, and estates . . . . on the mainland of the island of Borneo commencing from the Pandassan river on the north-west coast and extending along the whole east coast as far as the Sibuco river in the south, and comprising amongst others the States of Paitan, Sugut, Bangaya, Labuk, Sandakan, Kina Batangan, and Mumiang, all the other territories and States to the southward thereof bordering on Darvel bay and as far as the Sibuco river, with all the islands within three marine leagues of the coast; and in consideration of that grant the grantees promised to pay as compensation to the Sultan, his heirs and successors, the sum of 5,000 dollars per annum;" one of the grantees to be nominated and appointed by the Sultan of Sulu "supreme and independent ruler of the above-named territories with the title of Datu Bandahara and Rajah of Sandakan with absolute power, &c., &c.," as before indicated in connection with the grant from the Sultan of Bruni.

To purchase these interests and powers, and to exercise the rights connected with them, a Royal Charter of Incorporation, dated the 1st day of November, 1881, has been granted to the BRITISH NORTH BORNEO COMPANY upon a petition to Her Majesty in Council, under certain conditions, which are published in the *London Gazette* of November 8th, 1881. The chief of these conditions relate to the taking over of the territories and lands, and to the due payment of the annual subsidies; the Company is to remain British in character

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and domicile; differences with the Sultans must be submitted to the Secretary of State; slavery must be discouraged, and abolished by degrees; there must be no interference with the religion of the people; justice must be done with careful regard to the customs and laws of the people; the crown may appoint judicial officers; the Company's principal representative in Borneo must be approved by the Secretary of State; the Company may hoist and use a distinctive flag approved of by the Secretary of State and the Lords' Commissioners of the Admiralty. The Company is authorised and empowered to improve, develop, clear, plant and cultivate territories and lands; to make and maintain therein roads, harbours, railways, telegraphs, and other public works, and carry on mining and other industries; to settle the territories and lands, and aid and promote immigration into the same; to acquire and hold or charter or otherwise deal with steam-vessels and other vessels; to deal in merchandize, the growth, produce or manufacture of the Company's territories, or other merchandize; to carry on any lawful commerce, trade, or dealing whatever, &c., &c. The Company is not authorised to set up or grant any general monopoly of trade. The deed of settlement must be submitted to and approved by the Lords of Her Majesty's Council, and be executed by the Company within one year after the date of the charter; and should the Company fail to comply with any material condition of the charter it may be revoked.

The extensive territory which is the subject of the charter above referred to, must have a coastline of not much under a thousand miles, if it is not in excess, with an area of not less than 20 to 22 thousand square miles, occupying as it does all the northern part of Borneo from the Kimanis river on the west coast to the Sibuco river on the east coast. The greater part of the interior, especially that marked on maps as Sabah, is mountainous and covered with an almost impenetrable forest. From this elevated part descend rivers of great size and extent, especially those which take an easterly course towards and over the wide plain which ends on the eastern side in numerous fine bays and harbours.

Along the western coast of the territory, extending from the

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Kimanis river to Sampanmangio point in a N.N.E. ½ E. direction for close upon 130 miles, there are several rivers and some valuable harbours. The courses of the rivers are short owing to the elevation and proximity of the interior table-land, but many are broad, and with few exceptions navigable for small craft; they are the Benoni, Minani, Inanam, Kabatuan, Menkabong, Tawalan (or Kawalan), Sulaman, Abai, and Tampassuk; most of them are barred but have deeper water within.

The bays are also more numerous than to the southward: four are particularly worthy of note, Gaya, Sapangar, Ambong, and Usukan. Gaya bay is formed by the northern point of Gaya island and Tanjong Kaetan, while Sapangar, Udar, Udar Kechil, and Udar Tega are a group of islands on the north side of entrance to Gaya bay, and form the land-locked anchorage in Sapangar bay, the most secure harbour on the north-west coast of Borneo. There is good and safe anchorage at Ambong, and supplies as well as water can be readily obtained there; the bay is capacious, with a town at its head, Usukan bay is three miles northward of Ambong and also affords safe anchorage, with an excellent watering place: this is the only convenient spot for communicating with Abai river. Off the coast, scattered here and there, are a few small islands and islets; and the shoals and coral reefs do not here so thickly overspread the sea as on the east coast.

Sampanmangio point, the northernmost extremity of Borneo, is in lat. 7° 4′ N., and has a small islet off it.

Malludu bay, at the extreme north end of the territory, and at the head of which is Malludu river with a village of the same name, trends southerly for a distance of 20 miles, and is 17 miles wide at its entrance, with depths of 18 to 19 fathoms, decreasing gradually towards the head of the bay. Thence the coast takes first a S.Ely. direction for 195 miles, and then bends towards S.W. for 115 miles to the entrance of the Sibuco river, and the boundary of the Dutch jurisdiction.

The first bay eastward of Malludu is unnamed and has not been examined, then come in succession Labuk, Sandakan, Darvel, and Sibuco bays, all of which are capacious, with large rivers emptying into them. At wide intervals along the coast the

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Company have already established settlements, and their agents have begun to traverse and examine the interior.

The climate and soil are favourable for a variety of productions not yet found in Borneo. The channels and navigation leading to the harbours on the east side are much more intricate than those on the west coast. The population is also more thinly scattered here than in other parts of Borneo.

Banguey island is 19½ miles long, north-east and south-west, and about 13 miles broad; its highest peak attains an elevation of 1,876 feet. Around it are many small islets, and numerous coral patches through which the channels are somewhat intricate. It lies 7 miles from the north end of Borneo.

The following details as to the productions and commercial capabilities of Northern Borneo, Labuan, Bruni, and Sarawak, are summarised from the most recent reports of the Acting Consul-General in Borneo.

With the exception of the port of Bruni, which has direct steam communication with Singapore, almost the entire produce exported from this portion of Borneo finds its way in native boats, and recently in one small coasting steamer, to Labuan, whence it is re-exported principally to Singapore, and by an occasional vessel to Hong-Kong.

The principal article imported from Singapore is rice, for though the country could without difficulty be made to produce sufficient rice to support its sparse population, yet owing to bad government—the natives of the interior never being certain that their rice would not be seized by any of their numerous *pangerans* or chiefs; to the natural indolence of the inhabitants, who prefer occasional expeditions in search of jungle produce, or the cultivation of the sago palm, to settling down steadily to agricultural pursuits; to a succession of bad harvests; to the scourge of small-pox in 1872 and of cholera in 1875, and to the drought, accompanied by vast jungle fires, which prevailed during the first half of 1878—the inhabitants of all this portion of Borneo are to a great extent dependent on other countries for their principal article of food.

Next to rice, the most valuable import in 1878 was cotton

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cloths—grey shirtings, T-cloths, Turkey red and other coloured cottons, *kain kitam* (damaged shirtings dyed by the Chinese in Singapore), and sarongs and kerchiefs for the head, of German, Javanese, and Indian manufacture.

Tobacco is another article which is now imported to a considerable extent, though large quantities are grown in the interior by the tribes of Dusens and Muruts. This native tobacco, or *sigup Bruni*, was formerly preferred by the inhabitants, but the preference is now given to Java and Palembang tobacco, which is more expensive. Chinese tobacco is also imported for the use of both Chinese and Malays, as also is opium, which is now used by several of the younger Bruni pangerans, and many of the Sulus.

The principal article of export to Singapore from the port of Bruni is sago flour, which is prepared in the factories of two Chinese (British subjects) in Bruni, who purchase the raw sago from the natives and work it up into sago flour by Chinese coolie labour, using no machinery.

The principal remaining exports are gutta-percha and india-rubber, camphor, of the valuable kind known as *barus*, bees'-wax, and birds' nests.

The two Chinese sago manufacturers are now experimenting with tapioca, and have several hundred acres planted with that root. In many parts of the country the natives of the interior cultivate tapioca for their own consumption, and the root is said to be of large size. Until, however, a settled government is established in Borneo, neither Chinese nor European planters can embark in agricultural operations on a large scale.

Produce is for the most part brought to Bruni in small native prahus and purchased by Chinese traders, who export it to Singapore in a British steamer.

The articles exported from Northern Borneo and Palawan to Labuan in 1876-7-8, with the exception of sago flour, manufactured by Chinese settlers, were all natural animal and vegetable productions, requiring no further trouble beyond their collection on the part of the natives, such as birds' nests, bees'-wax, camphor, gutta-percha, and indiarubber, seed pearls, rattans, and tortoise-shell. The chief export is sago, both raw and manufactured into

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flour. The sago trade is entirely confined to Borneo Proper, and none is received from the country north of the river Pappar, which, however, contributes instead the major part of the birds' nests, gutta-percha, bees'-wax, camphor, rattans, and seed pearls. The raw sago received at Labuan is worked up into sago flour at Chinese factories in the colony, and exported to Singapore.

No pearl sago is made either at Bruni or Labuan, and in the latter sago flour is not an article of consumption; in parts of Borneo Proper it is boiled and eaten, under the name of *boyat*, with any acid condiment obtainable. The sago palm is one requiring the minimum of care and cultivation. A young tree is planted in swampy ground, and let alone for ten years, when it is ready to be cut down and the pith taken out of its trunk. Meanwhile, however, young sago palms have been springing up from its base, which in turn beget other palms and are themselves cut down and utilised.

The remaining articles, in the order of their commercial value are birds' nests, rattans, camphor, gutta-percha and indiarubber, bees'-wax, and seed pearls. These articles, as already mentioned, come chiefly from the northern portion of the district; and the settlement there of Europeans, whether of a British company, or of a foreign government would naturally divert this portion of the trade from the British colony of Labuan, as has happened in the parallel case of Sarawak to the southward.

The Philippine Government have been long endeavouring to attract the natives to free ports, which they have established at the islands of Balabac and Palawan, but hitherto their efforts have met with but small success, and the traders apparently prefer the longer journey to the English colony of Labuan. These Spanish ports are said to be "free;" but Labuan Chinese traders who have visited Balabac report that they are not permitted to trade there, the Governor informing them that only cotton goods which have passed through Manila can be landed there.

The trade of northern and eastern Borneo is brought to Labuan chiefly in Sulu boats, in a few Labuan native-owned schooners of small size, and in a British steamer, which also visits Sulu: that of Borneo Proper is carried chiefly in Bruni

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prahus. At Labuan this produce is purchased by Chinese traders, and shipped principally to Singapore.

The value of the exports from that portion of Borneo which is not subject to the Dutch, and nearly all of which finds its way to British colonies—Labuan, Singapore, and Hong-Kong—may be put down roughly at £300,000 annually.

The Sulu boats also bring produce which is obtained from the islands of the Sulu Archipelago.

The articles peculiar to the Sulu islands, as compared with Borneo, are trepang (*beche-de-mer*), mother-o'-pearl shell, pearls (as distinguished from seed pearls),* and rope; while, on the other hand, they possess no sago, rattans, gutta-percha and indiarubber, birds' nests, bees'-wax, nor camphor.

The articles which the natives—Bornean and Sulus—receive in exchange for their goods are grey shirtings, T-cloths, dyed shirtings, American drill, Turkey red and other cotton cloths, German, Javanese, and Indian sarongs and headkerchiefs, Chinese trowsers, cotton twist, Javanese and Chinese tobacco, opium, rice, salt, brassware, iron, muskets, gunpowder, &c.

The trade at present is carried on between the Chinese on the one hand and the Mahommedan settlers along the coast on the other—viz.: Sulus, Bugis or Bajows, Bruni men, and a few Illanuns —who are jealous of the aboriginal tribes of the interior having much communication with the outer world. Attempts of Europeans to trade directly with the natives have always ended in failure.

The drawbacks to the development of trade are the want of a strong government and the indolent and unambitious character of the people. The power of the Sultans is very weak, and is shared with numerous petty, local, semi-independent chiefs, whose one idea of government is to drain the resources of the country for their own benefit. In Borneo Proper many of the rivers are regarded as the private property of the Sultan and of certain of the Pangerans or nobles; the revenues of others are attached to certain of the non-hereditary officers of state.

It has been well observed that, "from a very general inter-

* A few inferior pearls from a small oyster are obtained from Borneo.

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course with all the tribes, Malay, Bajow, as well as the Dyak or mountain races, it was apparent that by kindness and firmness they are disposed to be friendly. Timidity, or too much suspicion on the part of visitors, naturally renders them cautious. They are, from the knowledge of their own weakness, compared to Europeans, timid and suspicious, and when they behave with apparent treachery, there is reason to suspect, if the truth could be known, that their acts result more from a view of self-preservation than from any feeling of revenge, desire of plunder, &c., and nothing is so much calculated to inspire this suspicious feeling than an injudicious timidity or armed truce, which is almost invariably resented by them with derision, the precursor of bad feeling, insult, or hostility. Our connexion with Borneo Proper will doubtless soon dissipate this timidity and fear of collision with the coast people. But caution is imperative in all transactions with the Malay race."

The geological formation of Borneo is described as consisting chiefly of sandstone—with limestone, clay-slate, granite (syenite), quartz and porphyry occurring only occasionally. Such being the case, and the soil of a country being formed by the disintegration of its rocks, it need hardly be said that the soil of Borneo cannot be compared with that of Java, Sumatra, the Sulu Archipelago, or the Philippines—all islands of volcanic origin. Towards the north, however, and in the plains in the neighbourhood of the great Kini Balu range, there is found soil of exceedingly good quality; and the success with which the natives, in their rude manner, grow for their own consumption and use, rice, sugar-cane, tapioca, indigo, and (in some places) coffee, argues well for the future of the agriculture of Borneo whenever a just and strong Government shall be established and Chinese labour and European capital combine to develop its resources.

At present the greater part of the island is clothed with a dense primeval forest of lofty trees, many of which afford excellent timber; and until the virgin soil it covers is cleared by the planter, it is idle to speculate on the mineral resources of the country, but the existence in North Borneo of coal, antimony ore, and gold, has been already proved beyond a doubt.

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A country such as is North Borneo, with fine harbours, excellent internal water communication, unlimited natural productions, great mineral wealth including good coal, and an essentially tropical climate not inimical to a European constitution, ought to have a great future before it if properly governed and carefully administered, bearing in mind that while developing the unbounded resources of the region and encouraging industrious immigrants from the teeming populations of China, a judicious and conciliatory treatment of the natives is of the first importance.

NOTES FROM CONSULAR REPORTS.

SAMOS.

DRIED grapes for the French market, olives and olive oil for Turkey, wine for various places in Europe constitute the exports of this island. From the Consul's report trade appears to be in a very flourishing condition. Austrian Lloyd's have established a new weekly service between Samos, Alexandria, and Smyrna, and an English company, "Bell's Asia Minor," also keeps up a regular communication with Smyrna and the Archipelago.

TREBIZOND.

This is a Black Sea port at which no vessels under the British flag were seen during 1880. Turkish, Austrian, French, and Russian steamers call regularly, and some vessels of other nations occasionally visit the port. Notwithstanding the absence of British ships, there is a fair market at Trebizond for British goods. Cotton and wollen manufactures, metals, hardware, figure as the principal imports, but the general import trade for 1880 showed a marked decline. American petroleum is becoming an article of general consumption. Exports through Trebizond from Turkey and Persia are from the former, principally tobacco, beans, hides and skins, nuts and walnuts, &c., and from the latter, silks, carpets, shawls, tumbeki. It is somewhat strange that British ships have none of the carrying trade to and from this important port.

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CIUDAD BOLIVAR—VENEZUELA.

An improved prospect for the mining companies presents itself. The political condition of things is quiet. More gold exported in 1880 than in any previous year, owing to new discoveries.

MARACAIBO—VENEZUELA.

Coffee is the staple, and is exported to New York only, the carrying trade being entirely in the hands of the Atlas Steamship Company, of Liverpool, which runs two steamers monthly. Cow-hides, cocoa, balsam of copaiba, are secondary articles of export; 1880 was not a good year for trade.

RAGUSA.

Olive oil, insect powder, and wine, the only exports, are sent to Trieste. A good deal of the wine ultimately finds its way to Bordeaux. Clothing, colonial goods, and petroleum are imported from Trieste, coals from England, grain from Russia and Albania, tiles and bricks from Italy. The number of steamers visiting the port shows an increase in 1880, but none were English vessels.

GUAYAQUIL—ECUADOR.

Cocoa, India-rubber, Peruvian bark, and ivory nuts are the principal exports from this port, and apparently the great bulk of the carrying trade is performed by British steamers. The Consul does not give any information as to the nature or quantities of the imports. Since January, 1881, a duty of about 1d. per ton is charged on all vessels under 300 tons register, and about ½d. on vessels above that tonnage.

SUEZ.

The Consul reports a considerable increase of traffic in 1880. For coaling it is a valuable resort, and some rather brisk competition keeps the price of coal down. Many large shipping houses have special representatives for receiving or obtaining cargo on freight, booking passengers, &c.

BORDEAUX.

The year 1880 was one of great commercial activity at this port, but the imports were largely in excess of the exports. The deficient vintages caused by *phylloxera*, &c., have been met by large imports of wine from other countries, which has gone out

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again as French light claret, and England takes by far the largest share of the Bordeaux wines. Grain and flour from the United States, coffee from the Brazils, coal and coke from Great Britain and elsewhere ; sugar, sheepskins, and wool have been largely imported. Wine, cotton and woollen textures, skins, furs, fruit, fixed oils, earthenware, glass, fish, &c., &c., are among the prominent exports. The shipping trade increases. English vessels are the most numerous at present, but France shows an increase in the number of oversea vessels. The shipping bounties may possibly be the means of a still further increase in 1881.

CORRESPONDENCE.

VISIBILITY OF RED RAYS IN THICK WEATHER.

To the Editor of the "Nautical Magazine."

Dear Sir,—Having read in your Magazine for this month, a letter from "G. H. L.," stating that in hazy weather he could not see the red flash from the Wolf Rock Light, I beg to say that some years ago I had a similar experience in the case of the Flambro' Head Light, which shows one red followed by two white flashes. I was about eight miles from Flambro' Head, it came on showery and during the rain squally. I could only see the two white flashes at unequal times, which showed with diminished power through the rain, while the red was entirely obscured. I was much surprised at the time as I understood the red flashes had been strengthened so as to be equal to the white, but it then became evident to me that they are not so *in all weathers* at sea.

I saw a case in the papers some time ago where the captain and mates differed as to the appearance of the Sunk Light, one said it was a white revolving light, and the other was not sure but thought there was a red flash occasionally, and eventually the vessel went on the Long Sand.

Noticing your editorial remark that the mistake might have occurred through colour blindness, and as I am pretty well sure I am not colour blind, I have sent you my experience on the

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subject, as perhaps you may have other correspondence relating to it.

Considering the large percentage of people who are colour-blind, and partially colour blind, and also that in some states of the weather that colour is misleading to those who are not colour-blind, it is a question whether it should not be used very sparingly, and when used it is better as at Flambro', than as at the Wolf, the unequal times seen in the former case where there are two white and one red, being a better check, or means of recognising it, than at the Wolf, where the light shows alternately red and white, and in the absence of the red flash it would present the appearance of a revolving white light of a slower rate only.

I am, dear sir, yours faithfully,

Hull, 8th Dec., 1881. A COASTING SKIPPER.

INSURANCE OF SEAMEN'S LIVES.

To the Editor of the "Nautical Magazine."

SIR,—I would respectfully ask if a *permanent relief fund* could not be raised to meet the annual loss of "bread winners" which is yearly taking place on our coasts? My opinion is that every seafaring man ought to have his life insured by some means or other, and if some plan could be devised by which this could be done through the shipping offices at the different ports in the United Kingdom, it would be a great boon to the widows and orphans so suddenly bereft of their husbands and fathers.

When the sad colliery accident at Hartley took place in 1862, and 472 widows and children were rendered destitute, the people of this country—from the Queen to the lowest of her subjects—came nobly forward and subscribed a sufficient sum to make them comfortable for life!

It is a well-known fact that we are having almost daily losses at sea, and in the aggregate far more widows and orphans are created in *one year* than the sad catastrophe produced at Hartley Colliery, and comparatively few hear anything about them—hence the necessity of a national fund. I would again ask, can a permanent fund for the sailor as well as the miner not be established? The coal owners of the north of England show a noble example to the

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shipowners and others with respect to the miners' permanent fund, by contributing a similar sum to that subscribed by the men. Would it be too much to ask the shipowners to offer to meet their employés in the same manner?

If a proposition of this kind were made by the shipowners of any port, arrangements could doubtless be made with the Board of Trade to obtain assistance from the shipping offices to work out the plan upon a national system for the benefit of all concerned. A small annual subscription from every man in our Mercantile Navy, would realize a handsome sum, especially if it were doubled by the shipowners of the United Kingdom?

I am, Sir, yours truly,

R. THUBRON.

Newcastle-on-Tyne, 17th December, 1881.

MARINE INVENTIONS.

Monthly List of Patents—Compiled for this Journal by Messrs. W. P. Thompson and Boult, British and International Patent and Trademark Agents and Consulting Engineers, 323, High Holborn, London, W.C.; Berridge Street, Leicester; also by Messrs. W. P. Thompson & Co., 6, Lord Street, Liverpool.

NEW PATENTS.

5103. Everden Wimshurst, of Victoria Park, Middlesex. "Improvements in apparatus for distilling water in ships or vessels."

5245. Johann Anton Andrée, of Esens, Ostfriesland, Germany. "Improvements in ships' propellers and apparatus in connection therewith." (A communication.)

5379. James Campbell Baker, of Liverpool. "Improvements in ventilating ships' buildings and other structures, mines, tunnels, and the like, and in apparatus therefor."

5380. Edward Jacob Hill and Josiah Latimer Clark, both of Victoria Street, London. "Improvements in apparatus for detaching boats, buoys, and other floating objects."

5417. William Henry Marks, of 36, Crutched Friars, London.

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"Improvements in the construction of steamers and other ships, boats, and vessels."

5442. Edward Charles Martin, of Ipswich, Suffolk. "Improvements in rowlocks for boats."

5455. James Taylor, of Birkenhead. "Improvements in screw propellers for ships and other navigable vessels."

2128. May 16, 1881. (Provisional only, 2d.) Andrew Betts Brown, engineer, and William Falconer King, electrician, both of Edinburgh, in the county of Midlothian, North Britain. "Improvements in apparatus for steering ships." This invention has for its object so to combine a compass with hydraulic or steam steering apparatus, as automatically to keep a vessel in her proper course. The following arrangement are described:—The compass consists of two or more magnetic needles fixed parallel to each other, and so arranged, that their vibratory period may be such as to give sufficient steadiness at sea. To the compass a thin contact piece of platinum wire is attached, and is in electric contact with the compass bowl. The compass contact piece extends between two other contact pieces carried by, but insulated from the bowl. Suitable electric connections are provided, and the bowl is fitted with gimbals in the usual way, and attached to a vertical shaft on which it is adjustable according to the course to be taken, and the shaft has on it a lever connected with the rudder, so as to make or break contact as may be desirable. The electric connections work suitable apparatus, say hydraulic, and these actuate the rudder.

2156. May 17, 1881. Price 6d. Johnson. Antoine Jean Amable Lagane, of Paris, in the Republic of France, engineer. "Improvements in torpedo boats." The said invention has for its object the protection of torpedo boats from the danger to which they are liable from exposure to projectiles, such as thrown by the mitrailleuse or similar ordnance. The hull is entirely submerged below the surface of the water, so that the upper deck is maintained at sufficient depth to protect it against projectiles, the floating capacity and control of the vessel are ensured by a watertight float permanently connected with the upper-deck, and constructed of solid wood or consisting of metal chambers filled with non-absorbent material, such as cork, &c.

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TIDE TABLES FOR JANUARY, 1882.

Also Ports of Reference for the Constants in the next Table.

Week Day.	Month Day.	London Bridge.		Hull.		North Shields		Leith.		Devonport.		Dover.		Weston-super-Mare.		Liverpool.		Greenock.		Queenstown		Kingstown.		Londonderry.		Brest.	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
		H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
S	1	11 33	—	3 47	4 18	0 51	1 20	—	0 15	2 46	3 19	8 30	8 59	3 57	4 32	8 53	9 20	9 27	9 57	2 18	2 49	8 39	9 9	5 35	6 0	1 14	1 43
M	2	0 5	0 35	4 46	5 11	1 46	2 10	0 40	1 4	3 49	4 16	9 26	9 51	5 3	5 31	9 44	10 6	10 24	10 49	3 17	3 42	9 37	10 1	6 24	6 47	2 9	2 32
Tu	3	1 0	1 22	5 33	5 55	2 32	2 52	1 27	1 49	4 41	5 4	10 15	10 38	5 56	6 20	10 27	10 48	11 12	11 34	4 6	4 28	10 21	10 40	7 10	7 32	2 53	3 14
W	4	1 48	2 9	6 17	6 38	3 12	3 31	2 10	2 30	5 26	5 47	11 0	11 21	6 43	7 4	11 9	11 30	11 56	—	4 49	5 10	10 59	11 18	7 53	8 12	3 35	3 55
Th	5	2 28	2 45	6 58	7 17	3 50	4 9	2 49	3 6	6 6	6 24	11 41	—	7 24	7 41	11 49	—	0 17	0 37	5 30	5 48	11 36	11 54	8 29	8 45	4 14	4 31
F	6	3 4	3 20	7 35	7 52	4 27	4 43	3 22	3 39	6 41	6 58	0 1	0 20	7 48	8 15	0 7	0 24	0 55	1 13	6 6	6 23	—	0 12	9 1	9 17	4 48	5 5
S	7	3 38	3 56	8 9	8 25	5 2	5 19	3 56	4 13	7 14	7 30	0 39	0 57	8 31	8 46	0 41	0 58	1 31	1 47	6 40	6 56	0 30	0 47	9 32	9 47	5 22	5 37
S	8	4 11	4 28	8 41	8 57	5 35	5 52	4 30	4 47	7 45	7 59	1 15	1 33	9 1	9 16	1 14	1 30	2 8	2 19	7 12	7 28	1 4	1 21	10 2	10 18	5 52	6 8
M	9	4 44	5 0	9 14	9 32	6 9	6 27	5 4	5 21	8 13	8 28	1 51	2 8	9 31	9 46	1 46	2 2	2 35	2 51	7 44	8 0	1 38	1 56	10 35	10 53	6 25	6 42
Tu	10	5 15	5 32	9 50	10 8	6 45	7 3	5 39	5 58	8 43	8 58	2 25	2 42	10 1	10 15	2 19	2 36	3 7	3 24	8 16	8 32	2 14	2 32	11 12	11 33	7 0	7 18
W	11	5 48	6 6	10 26	10 45	7 22	7 42	6 18	6 38	9 15	9 33	2 59	3 17	10 29	10 44	2 53	3 10	3 41	3 59	8 49	9 7	2 51	3 10	11 57	—	7 37	7 56
Th	12	6 26	6 46	11 6	11 31	8 4	8 28	6 59	7 23	9 53	10 15	3 36	3 56	11 2	11 23	3 29	3 50	4 18	4 39	9 27	9 48	3 31	3 54	0 24	0 53	8 17	8 41
F	13	7 10	7 33	—	noon	8 56	9 28	7 50	8 21	10 40	11 8	4 18	4 42	11 49	—	4 15	4 45	5 2	5 29	10 13	10 43	4 21	4 51	1 26	2 3	9 8	9 40
S	14	8 1	8 33	0 31	1 3	10 3	10 39	8 56	9 33	11 41	—	5 10	5 40	0 20	0 54	5 20	5 58	6 0	6 34	11 19	11 57	5 23	5 57	2 40	3 16	10 16	10 56
S	15	9 10	9 51	1 37	2 11	11 15	11 52	10 10	10 46	0 18	0 58	6 18	6 50	1 31	2 10	6 40	7 19	7 11	7 50	—	0 36	6 31	7 6	3 50	4 23	11 36	—
M	16	10 30	11 8	2 46	3 22	—	0 22	11 22	11 55	1 38	2 17	7 30	8 7	2 51	3 31	7 57	8 33	8 29	9 5	1 15	1 54	7 42	8 17	4 53	5 20	0 16	0 52
Tu	17	11 45	—	3 57	4 30	1 1	1 31	—	0 2	2 55	3 31	8 41	9 11	4 10	4 45	9 4	9 31	9 39	10 9	2 30	3 2	8 51	9 21	5 46	6 12	1 25	1 55
W	18	0 18	0 47	4 58	5 23	1 58	2 22	0 51	1 17	4 4	4 33	9 40	10 8	5 18	5 48	9 57	10 22	10 37	11 4	3 31	3 58	9 49	10 15	6 38	7 8	2 22	2 46
Th	19	1 14	1 40	5 48	6 13	2 46	3 9	1 42	2 6	5 1	5 27	10 34	11 0	6 16	6 43	10 47	11 11	11 30	11 56	4 24	4 49	10 59	11 2	7 28	7 53	3 10	3 34
F	20	2 4	2 27	6 38	7 2	3 32	3 55	2 30	2 52	5 53	6 19	11 26	11 52	7 9	7 33	11 35	11 58	—	0 21	5 14	5 39	11 24	11 46	8 16	8 38	3 58	4 22
S	21	2 50	3 18	7 26	7 50	4 18	4 41	3 15	3 37	6 43	7 7	—	0 17	7 56	8 18	—	0 21	0 46	1 10	6 8	6 26	—	0 9	8 59	9 20	4 45	5 8
S	22	3 35	3 59	8 13	8 36	5 4	5 27	3 59	4 22	7 29	7 51	0 42	1 7	8 40	9 1	0 44	1 7	1 34	1 58	6 49	7 12	0 32	0 56	9 41	10 2	5 31	5 54
M	23	4 22	4 45	8 59	9 21	5 50	6 13	4 45	5 8	8 13	8 35	1 31	1 55	9 22	9 43	1 29	1 51	2 20	2 42	7 35	7 57	1 20	1 44	10 24	10 46	6 16	6 38
Tu	24	5 7	5 27	9 43	10 5	6 37	7 1	5 32	5 56	8 56	9 16	2 18	2 41	10 3	10 21	2 13	2 35	3 4	3 25	8 18	8 38	2 8	2 31	11 9	11 35	7 0	7 22
W	25	5 50	6 12	10 27	10 50	7 25	7 49	6 20	6 45	9 36	9 56	3 8	3 25	10 38	10 56	2 57	3 18	3 46	4 7	8 58	9 18	2 54	3 17	—	0 8	7 44	8 7
Th	26	6 34	6 58	11 16	11 47	8 15	8 44	7 11	7 39	10 18	10 41	3 47	4 10	11 17	11 41	3 40	4 5	4 29	4 53	9 41	10 6	3 42	4 9	0 35	1 10	8 32	8 59
F	27	7 24	7 53	—	0 26	9 16	9 52	8 9	8 44	11 7	11 37	4 34	5 2	—	0 10	4 34	5 8	5 30	5 59	10 36	11 11	4 39	5 13	1 48	2 28	9 30	10 7
S	28	8 23	9 0	0 55	1 30	10 31	11 10	9 24	10 4	—	0 12	5 34	6 9	0 46	1 25	5 48	6 33	6 25	7 5	11 51	—	5 50	6 27	3 8	3 46	10 49	11 34
S	29	9 44	10 28	2 7	2 45	11 50	—	10 44	11 22	0 51	1 31	6 48	7 29	2 7	2 50	7 17	7 57	7 46	8 28	0 33	1 15	7 5	7 48	4 22	4 55	—	0 16
M	30	11 9	11 48	3 23	4 0	0 29	1 4	11 58	—	2 11	2 49	8 9	8 45	3 32	4 11	8 34	9 6	9 7	9 42	1 56	2 33	8 20	8 54	5 25	5 51	0 55	1 29
Tu	31	—	0 21	4 33	5 1	1 35	2 1	0 29	0 55	3 25	3 55	9 15	9 40	4 46	5 15	9 34	9 56	10 11	10 36	3 3	3 29	9 23	9 49	6 15	6 36	1 58	2 21

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TIDAL CONSTANTS

For Various British, Irish, and European Ports.

By applying the Tidal Constant of the place, according to its sign (+ *add*, — *sub.*), to the time of high water on the given day at the port of reference, you have the time of high water at the place sought.

Place.	Constant. H. M.	Port of Reference.
Aberdeen	−1 17	Leith
Aberystwyth	−3 52	Liverpool
Alderney	+2 59	Brest
Antwerp	+5 13	Dover
Arbroath	−0 42	Leith
Arcachon	+0 50	Brest
Arklow	−2 25	Kingstown
Ayr	−0 18	Greenock
Banff	−1 49	Leith
Bantry harbour	−1 14	Queenstown
Barnstaple bridge	−0 26	Weston-s.-Mare
Bayonne	−0 2	Brest
Beachy head & Rye bay	+0 8	Dover
Beaumaris	−0 51	Liverpool
Belfast	+2 42	Londonderry
Berwick	−1 5	N. Shields
Blyth	−0 8	N. Shields
Bordeaux	+3 3	Brest
Boulogne	+0 18	Dover
Bridport	+0 22	Devonport
Bristol & King Road	+0 19	Weston-s.-Mare
Cadiz	−2 2	Brest
Caernarvon	−1 56	Liverpool
Calais	+0 37	Dover
Campbelltown	−0 28	Greenock
Cardiff	+0 2	Weston-s.-Mare
Cardigan bar	−4 22	Liverpool
Carlingford bar	−0 10	Kingstown
Chatham	−0 47	London
Cherbourg	+4 2	Brest
Coleraine	−1 37	Londonderry
Coquet Road	−0 28	N. Shields
Cordouan Tower	−0 10	Brest
Cowes (West)	−0 27	Dover
Crinan	+4 41	Greenock
Cromarty	−2 21	Leith
Dartmouth	+0 38	Devonport
Deal & Downs	+0 8	Dover
Dieppe	+7 19	Brest
Donaghadee	+0 8	Kingstown
Donegal harbour	+0 17	Queenstown
Douglas & Ramsay	−0 11	Liverpool
Dublin bar	+0 2	Kingstown
Dundalk	−0 16	Kingstown
Dungeness	−0 27	Dover
Dunkerque	+0 56	Dover
Exmouth	+0 38	Devonport
Falmouth	−0 46	Devonport
Fecamp	+6 57	Brest
Ferrol	−0 47	Brest
Flamborough head	−1 59	Hull
Fleetwood	−0 12	Liverpool
Folkestone	−0 5	Dover
Fowey	−0 29	Devonport
Flushing	+1 42	Dover
Galway bay	−0 26	Queenstown
Gibraltar	−1 27	Brest
Glasgow (Port)	+0 10	Greenock
Gloucester	+2 51	Weston-s.-Mare
Granville	+2 26	Brest
Gravesend	−0 48	London
Grimsby (Great)	−0 53	Hull
Guernsey (St. Peter)	+2 50	Brest
Hartlepool	+0 5	N. Shields
Harwich	−1 52	London
Havre	+6 4	Brest
Helgoland	+0 21	Dover
Holyhead	−1 12	Liverpool
Holy Island harbour	−0 58	N. Shields
Honfleur	+5 42	Brest
Inverness	−1 59	Leith
Jersey (St. Helier)	+2 38	Brest
Kinsale	−0 18	Queenstown
Lerwick (Shetland)	−3 47	Leith
Limerick	+1 15	Queenstown
Lisbon bar	−1 17	Brest
Littlehampton	+0 24	Dover
Llanelly bar	−0 38	Weston-s.-Mare
Lowestoft	−4 1	London
Lynn & Boston Deep	−0 29	Hull
Margate	−2 18	London
Maryport	+0 3	Liverpool
Milford Haven entr.	−0 58	Weston-s.-Mare
Montrose	−0 52	Leith
Morlaix	+1 6	Brest
Needles point	−1 26	Dover
Newcastle	+0 23	N. Shields
Newhaven	+0 39	Dover
Newport	+0 16	Weston-s.-Mare
Nieuport	+1 6	Dover
Nore	−1 28	London
Orfordness	−2 43	London
Oporto	−1 17	Brest
Ostende	+1 13	Dover
Padstow	−1 41	Weston-s.-Mare
Peel, Isle of Man	−0 15	Liverpool
Pembroke Dock	−0 42	Weston-s.-Mare
Penzance	−1 13	Devonport
Peterhead	−1 43	Leith
Piel harbour, Barrow	−0 18	Liverpool
Plymouth breakwater	−0 6	Devonport
Poole	−2 2	Dover
Port Carlisle	+0 47	Liverpool
Portland breakwater	+1 18	Devonport
Port Patrick	−0 58	Greenock
Portsmouth	+0 29	Dover
Ramsgate	−2 19	London
Rotterdam	+4 33	Dover
Santander	−0 17	Brest
Scarborough	+0 48	N. Shields
Selsea bill	+0 33	Dover
Sheerness	−1 21	London
Shoreham	+0 22	Dover
Sligo bay	+0 17	Queenstown
Southampton	−0 42	Dover
Spurn point	−1 3	Hull
St. Ives	−2 10	Weston-s.-Mare
St. Malo	+2 18	Brest
St. Mary (Scilly)	−1 16	Devonport
St. Nazaire	−0 7	Brest
Stornoway	+6 38	Greenock
Stromness (Orkneys)	−5 17	Leith
Sunderland	−0 1	N. Shields
Swansea bay	−0 53	Weston-s.-Mare
Tay bar	−0 11	Leith
Tees bar	+0 22	N. Shields
Tenby	−1 12	Weston-s.-Mare
Thurso	−5 49	Leith
Torbay	+0 17	Devonport
Tralee bay	−0 58	Queenstown
Ushant (Ouessant)	−0 15	Brest
Valentia harbour	−1 19	Queenstown
Waterford	+0 19	Queenstown
Westport	−0 4	Queenstown
Wexford	+3 20	Queenstown
Whitby	+0 22	N. Shields
Whitehaven	−0 9	Liverpool
Wick	−2 55	Leith
Wicklow	−0 41	Kingstown
Workington	−0 19	Liverpool
Yarmouth road	−4 43	London
Youghall	+0 18	Queenstown

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MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
1	England—South Coast—Eddystone	Particulars of new light.
2	„ S.E. Coast—Dungeness	Alteration of fog-signal.
3	„ „ South Sand Head	Alteration of fog-signal.
4	„ East Coast—Harwich	New buoy.
5	„ „ Humber River—Whitton Ness	Light-vessel altered in position.
6	Scotland — West Coast — Loch Cairn Bahn—Eilean na Gawn	Sunken rock discovered.
7	Ireland—S.W. Coast—Bantry Bay—Calf Rock	Lighthouse destroyed.
8	North Sea—Weser River—Rother Sand	Foundation of lighthouse destroyed.
9	Baltic — Femern Island — West Markelsdorf	New light.
10	Mediterranean — France — Marseille—Planier Islet	Light transferred to new lighthouse.
11	„ Archipelago—Greece—Oreos Channel, &c.	Torpedoes removed.
12	Africa—South Coast—Cape St. Francis	Sector of red light in July, 1883.
13	„ „ Kowie River — Glendower Peak	New beacon.
14	India—South Coast—Crocodile Rock	Position reported to be incorrect.
15	„ Bay of Bengal—Gulf of Martaban—Rangoon River—Eastern Grove	Permanent light re-exhibited.
16	Indian Ocean — Straits' Settlements—Malacca Strait—Penang	New light.
17	Eastern Archipelago—Sumatra—West Coast—Padang Islands—Pulo Pandang	Particulars of light.
18	„ „ Sunda Strait—Merak Islet	Discovery of a shoal.
19	China Sea—Philippines—Luzon—Manila Bay—St. Nicholas Banks	Destruction of light.
20	Russian Tartary—Peter the Great Bay—Askold Island	New light.
21	South Australia—Dredger Signals	Signals when passing.
22	„ Spencer Gulf—Hardwicke Bay—Port Victoria	New light on jetty.
23	Australia—South Coast—Port Phillip—Swan Spit	Destruction of lighthouse.
24	„ „ Port Western—Griffin Point	Alteration in colour of jetty light.
25	„ N.W. Coast—Tien Tsin Harbour—Reader Head	New Harbour light.
26	South Pacific—New Caledonia—Amédée Islet	New leading light established.
27	New Zealand — North Island — Port Nicholson—Fitzroy Bay	Discovery of sunken rock.
28	„ North Island—Wellington	Alteration in railway pier light.
29	West Indies—Venezuela—Oruba Island—Point del Cerrito Colorado	Temporary light.
30	United States—Virginia—Cape Henry	New lighthouse and improved light.
31	Newfoundland—South Coast—Langlade Island—Plate Point	New fog-signal.
32	„ „ Fortune Bay—Harbour Breton—Rocky Point	Light re-exhibited.
33	„ South Coast—Green Banks	A shoal sounding reported.
34	„ East Coast—Trinity Bay—Hants Harbour	New light.
35	Canada — St. Lawrence Gulf — Prince Edward's Island—Cape Bear	New light.
36	„ Scatari Island	New fog-signal near lighthouse.
37	„ Nova Scotia—Jeddore Rock	New light.

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NAUTICAL NOTICES.

All Bearings Magnetic, unless otherwise stated.

1.—ENGLAND.—*South Coast.—Eddystone New Lighthouse.*—The fixed white light at present shown at the Eddystone, will be temporarily exhibited from the new tower at or soon after the end of January, 1882, and thenceforward until the month of March following. With reference to Notice in 1881, on intended alteration in the character of the Eddystone light—such alteration will probably be made, as therein stated, in the month of March, 1882, of which further notice will be given in due course.

2.—ENGLAND.—*S.E. Coast.—Dungeness Lighthouse.—Alteration in Character of Fog-Signal.*—In accordance with Notice issued in 1881, the distinctive character of the fog-signal at Dungeness lighthouse has been altered, so that during the prevalence of fog it will give *two blasts* in quick succession *every two minutes;* the *first* blast a *high* note, and the *second* a *low* note.

3.—ENGLAND.—*S.E. Coast.—South Sand Head Light-Vessel.—Alteration in Character of Fog-Signal.*—In accordance with Notice issued in 1881, the distinctive character of the fog-signal at the South Sand Head light-vessel has been altered, and during the prevalence of fog will give *three blasts* in quick succession *every two minutes;* the *first* blast a *low* note, the *second* a *high* note, and the *third* a *low* note.

4.—ENGLAND.—*East Coast.—Approaches to Harwich.—Buoyage.*—According to Notice issued in 1881, a new buoy, called South Middle Shipwash, has been placed midway between the South West Shipwash and Middle Shipwash buoys, to cover the knuckle in the sand, and lies in 6½ fathoms at low water spring tides, with the following bearings, viz.:—S.W. Shipwash buoy, S. by W. ½ W. (distant $2\frac{1}{10}$th miles); Middle Shipwash buoy, N.E. ½ N. N$^{\text{thly.}}$ (distant $2\frac{4}{10}$ths miles); Sunk light-vessel, S.W. ½ S. (distant $6\frac{3}{10}$ths miles); Rough buoy, W. ½ N. (distant $3\frac{8}{10}$ths miles).

The *Swin Spitway Bell Buoy* has also been moved 1½ cable E. ½ N. of its former position.

5.—ENGLAND.—*East Coast.—Humber River.—Whitton Ness*

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Light-Vessel.—Alteration in Position.—In consequence of considerable changes having taken place in the channel round Whitton ness, south shore of Humber river, Whitton light-vessel has been moved to indicate the changes.

6.—SCOTLAND.—*West Coast.—Loch Cairn Bahn.—Sunken Rock Southward of Eilean Na Gawn.*—Information as to the existence of a sunken rock lying southward of Eilean na Gawn (Stick island), southern side of loch Cairn Bahn. This rock (locally known as *Pul na Gawn rock*), on which the steam yacht *Ulva*, drawing 12 feet, struck on 8th August, 1881, extends (within the 3-fathom line) about 50 yards in a N.E. and S.W. direction, with a greatest breadth of about 15 yards—the least depths found, 11 and 12 feet at low water spring tides, are on the N.W. part of this shoal ground. This shoalest part is distant 68 yards from high water mark at the nearest part of Eilean na Gawn, and lies with the following bearings, viz. :—Cairn on Eilean na Gawn, N. ½ E. ; Picts tower, E.N.E. ; House at head of cove (Ault na Gawn), S. ¾ E. *Variation*, 23¼° *W.*

7.—IRELAND.—*South-west Coast.—Bantry Bay Approach.—Destruction of Calf Rock Lighthouse.*—This lighthouse on the northern side of approach to Bantry Bay, was partially destroyed (tower half gone) during the gale on the night of the 27th of November, 1881. A temporary light of a similar character will be exhibited on the S.W. extremity of Dursey island, of which due notice will be given.

8.—NORTH SEA.—*Weser River Entrance.—Rother Sand.—Foundation of Lighthouse Destroyed.*—With reference to Notice in 1881, on the foundation of a lighthouse being laid in a depth of 26 feet at low water on the Rother (Red) sand, Weser river entrance, with white buoy No. 3 bearing W.S.W., distant about 5 cables—and on the exhibition of a provisional light about 15 feet above the foundation ;—on 13th-14th of October, the foundation disappeared, and no portion of it is visible at low water. As soon as practicable, a *wreck* buoy, painted green, would be moored near the position.

9.—BALTIC.—*Femern Island.—Light near West Markelsdorf.*—With reference to Notice in 1881 on the intended light from a

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lighthouse erected near West Markelsdorf, N.W. side of Femern Island; the light is visible through an arc of 270°—showing a *flashing white* light with *five successive flashes* of *one second* duration each, followed by an interval of *eight seconds*, through an arc of 100°, or between the direction of Flügge light and the bearing S.E. ¼ E.; a *fixed white* light through an arc of 147°, or between the bearings of S.E. ¼ E. and W. ¾ N.; and a *flashing white* light with *three successive flashes* of *one second* duration each, followed by an interval of *five seconds*, through an arc of 23°, or from the bearing W. ¾ N. to the direction of Marien light. It is elevated 86 feet above the sea (34 feet above the ground), and should be seen from a distance of about 11 miles. The lighthouse, octagonal in shape and 39 feet high, is, with keepers dwelling (adjoining) built of red bricks; it is situated about three-quarters of a mile southward of Markelsdorf point, and immediately behind the sea wall, which is 9 feet above the sea, so that the lower part of the building is not seen from seaward. Position, lat. 54° 31′ 35″ N., long. 11° 4′ 5″ E. *Variation*, 12¼° *W.*

10.—MEDITERRANEAN.—*France.—Approach to Marseille.—Light on Planier Islet.*—With reference to Notices in 1881, Planier islet light has been transferred to the new lighthouse, recently constructed about 27 yards N.E. of the old lighthouse. It is a *flashing* light (*electric*) with *three white flashes* and *one red flash*; the three white flashes forming one group follow each other at intervals of about *three seconds*, and the groups of white flashes are separated by an interval of about *twelve seconds*, in the middle of which interval the red flash will appear; elevation 207 feet above the sea (193 feet above the ground), and visible from a distance of 21 miles. Position, lat. 43° 11′ 55″ N., long. 5° 13′ 45″ E.

11.—MEDITERRANEAN.— *Archipelago.— Greece.— Oreos Channel and Gulf of Stylida.—Torpedoes Removed.*—With reference to Notice in 1881, the torpedoes laid down for exercise in the Oreos channel and gulf of Stylida, between Oreos (Orees) and Stylida (Stylis)—have been removed, and commanders of vessels are no longer required to take pilots at those places.

12.—AFRICA.—*South Coast.—Cape St. Francis Lighthouse.—Intended Sector of Red Light.*—Arrangements having been completed

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for fixing the necessary red shades within the lantern, it is intended on 1st July, 1882, to exhibit at Cape St. Francis lighthouse, an arc of *red* light extending from the bearing of S. 30° W. to S. 83° W. From a vessel to the eastward the light on a bearing of S. 83° W. will show distinctly red—but the mariner is cautioned that in consequence of want of sharpness in the change, an appearance of red may he observed over a further 9½°, so that a slight redness might be observable when bearing N. 87½° W. from a vessel. The light will continue red over the whole area between that bearing and the shore to the eastward. The change from red to white, westward (*i.e.*, on the bearing of S. 30° W.), occurs over the land; no red light will be visible from any place at sea, except from within the area of the light indicated in the preceding paragraph. The arc of red light includes the sectors of darkness caused by the intervening hillocks on Cape St. Francis, eastward of the lighthouse.

Note.—The red light should not be seen at all from a vessel passing on a safe course up or down the coast; and if seen, warns the navigator of his dangerous approach to the shore. *Variation*, 30° *W.*

13.—AFRICA.—*South Coast.—Kowie River.—Beacon on Glendower Peak.*—Erected a little on the seaward face of Glendower peak, about 4 miles westward of Kowie river (port Alfred), and will serve well to distinguish that monotonous part of the coast. The beacon is 50 feet high, pyramidal in shape and constructed of stone; the sides are each 24½ feet at the base, and 15½ feet at the top. The upper part is coloured black for 30 feet; the lower 20 feet is white. The beacon is built so that, vessels approaching from the eastward, or westward, should have one of the sides in full light or shade. Glendower peak, about three quarters of a mile from the beach, is green topped, smooth, and 622 feet above high water—the apex of the beacon is about 667 feet above high water. Position, lat. 33° 37′ 10″ S., long. 26° 49′ 30″ E.

14.—INDIA.—*South Coast.—Cadiapatam (Muttum) Point.—Crocodile Rock.—Reported Incorrect Position.*—The rock, about 16 miles westward of Cape Comorin, is stated to lie with Kotah islet bearing N. 9¼° W., and Adumdah islet, N. 33¼° E.—or

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nearly three-quarters of a mile S.S.W. of the position assigned to it.

Note.—Mariners should navigate this part of the coast with caution.

15.—INDIA.—*Bay of Bengal.—Gulf of Martaban.—Rangoon River Entrance.—Re-Exhibition of Permanent Light at Eastern Grove.*—With reference to Notice in 1881, the alterations to the arc of visibility of the Eastern Grove light were to be completed, and the permanent light exhibited, on the 10th December, 1881. The light will be, as before, a *white* light, elevated 93 feet above high water, and visible from a distance of 12 miles. The apparatus has been turned to eastward about two points, so as to render it more visible to vessels approaching Rangoon river from Moulmein, and the light will be visible between the bearings from N.E. by N. to N.N.W. ¼ W. *Variation*, 3° *E.*

16.—INDIAN OCEAN.—*Straits Settlements.—Malacca Straits.—Light at Penang.*—A *fixed red* light will be exhibited from a lighthouse on Fort Point, George Town, Prince of Wales' Island, from the 1st January, 1882, in lat. 5° 24′ 45″ N., long. 100° 20′ 10″ E. The light is elevated 60 feet above the sea level; and should be seen from a distance of 10 miles. The lighthouse is situated on the N.E. bastion of Fort Cornwallis. It is an iron structure, painted white, and has an overhanging gallery round the light-room. The light is visible throughout an arc of 202° 30′, and the bearings at which it is cut off, are, from a vessel entering the North Channel, S.S.E., and entering the South Channel, North.

17.—EASTERN ARCHIPELAGO.—*Sumatra.—West Coast.—Padang Islands.—Pulo Pandang Light.*—With reference to Notice in 1881, the following additional information concerning the lighthouse and light has been published. The lighthouse, constructed of iron and pyramidal in shape, is painted white, as are also the keeper's dwelling and neighbouring buildings. Pulo Pandang light (*fixed white*) serves, in conjunction with the harbour lights on Pulo Pisang Besar and on the Apenberg, to conduct vessels to Padang road at night.

Note.—The proposal to show a sector of coloured light over

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Brandywine (Brandewijns) bay from Pulo Pandang lighthouse, has been abandoned. Pulo Pandang can be approached on all sides to a distance of 2 cables.

18.—Eastern Archipelago.—*Sunda Strait.—Shoal Northward of Merak Islet.*—Stated to have a depth of 29½ feet over it, lying about one mile North of Merak islet, N.W. coast of Java, Sunda strait. Position approximate, lat. 5° 55′ 30″ S., long. 105° 58′ 30″ E. *Variation*, ¾° *E.*

19.—China Sea.—*Philippines.—Luzon Island.—Manila Bay.—St. Nicholas Banks.—Destruction of Light Apparatus.*—During a storm on the 19th-20th August, 1881, the light on St. Nicholas banks, S.E. side of Manila bay, was washed away.

20.—Russian Tartary.—*Peter the Great Bay.—Light on Askold Island.*—Exhibited from a lighthouse on the south point of Askold island, eastern side of Peter the Great (Peter Weliki) bay. It is a *flashing white* light, visible seaward between the bearings of S. 49° E. and S. 71° W.; it should be seen from a distance of 25 miles. The lighthouse is painted red. Position, lat. 42° 43′ 40″ N., long. 132° 21′ 35″ E.

21.—South Australia.—*Signals used by Dredgers.*—After October, 1881, the following signals would be shown from the dredgers at work in that Colony, in lieu of those previously used. During the day—inward bound—a *red* ball denotes, leave the dredger on the starboard hand. A *black* ball denotes, leave the dredger on the port hand when passing. At night—inward bound—a *red* light under a *white* light denotes, leave the dredger on the starboard hand. A *green* light under a *white* light denotes, leave the dredger on the port hand when passing.

22.—South Australia.—*Spencer Gulf.—Hardwicke Bay.—Light at Port Victoria.*—Exhibited from the extremity of the jetty at Port Victoria, Hardwicke bay. It is a *fixed white* light, visible from a distance of about 5 miles. Position, lat 34° 29′ 45″ S., long. 137° 28′ 40″ E.

Note.—This light shows directly over Eclipse rock.

23.—Australia.—*South Coast.—Port Phillip.—Destruction of Swan Spit Lighthouse.*—On 14th September, 1881, Swan spit lighthouse was totally destroyed by collision—and until the light

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is replaced, a light-vessel would be moored in the position of the black buoy (one cable E.N.E. of the site of the lighthouse), from which is exhibited a *fixed red* light, visible from a distance of 8 miles.

24. — AUSTRALIA. — *South Coast. — Port Western. — Eastern Entrance.—Griffith Point Light.—Alteration in Colour.*—The light exhibited on the jetty at Griffith point, east side of Eastern entrance to port Western is now *fixed green* instead of fixed white as previously, and visible from a distance of 2 to 3 miles.

25.—AUSTRALIA.—*North-West Coast.—Tien Tsin Harbour.—Harbour Light on Reader Head.*—Exhibited from a lighthouse erected on the summit of Reader head, south side of Tien Tsin (Cossack) harbour or port Walcott. It is a *fixed white* light, visible seaward between the bearings of S. ½ E. and W, by N. ¼ N.; elevated 129 feet above high water, and should be seen from a distance of about 13 miles. The lighthouse, 24 feet high, is a dark pile structure with small lantern painted white. Position on Admiralty chart, lat. 20° 40′ 0″ S., long. 117° 8′ 40″ E. *Variation*, 1½° *W.*

26.—SOUTH PACIFIC.—*New Caledonia.— Leading Light on Amédée Islet.*—With reference to Notice in 1881, on the intended exhibition of a leading light from a lighthouse erected on Amédée islet, within Bulari pass, south coast of New Caledonia. The light is *fixed red*, elevated 47 feet above high water, and visible from a distance of 5 miles. The lighthouse consists of a foundation of masonry (29 feet above low water level), octagonal in shape and of a white colour, surmounted by an iron column 20 feet in height.

Note.—This light kept in line with the old light (fixed white) bearing N. 39¼° E. leads in mid channel through the northern Bulari passage. In order to maintain the deepest water, vessels should keep the red light open a little northward of the white light, and with a heavy sea, should avoid opening it to the southward of the white light. *Variation*, 10¼° *E.*

27.—NEW ZEALAND.—*North Island.—Port Nicholson.—Sunken Rock in Fitzroy Bay.*—Lying in the southern part of Fitzroy bay, eastern side of approach to port Nicholson—this danger

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(Arabella rock) on which the barque *Arabella*, drawing 15 feet, struck, when getting under way, is stated to be a pinnacle rock with a depth of 7 fathoms near it. The master of the vessel was not able to ascertain the exact position of the rock, but has given the following bearings and distance, as a near indication:—Pencarrow head lighthouse, N.N.W.; Baring head, E.S.E., distant about one mile. *Variation*, 15½° E.

Note.—Vessels passing or rounding Baring head, should give the head a wide berth.

28.—NEW ZEALAND.—*North Island.—Alteration in Railway Pier Light at Wellington.*—Exhibited from the extremity of the railway pier at Wellington, Lambton harbour. The temporary white light is discontinued; and in lieu thereof, two *fixed green* lights, placed horizontally 6 feet apart, and elevated 28 feet above high water, are exhibited. These lights are visible in any part of the harbour, from the north side of Queen's wharf (through west) to Nhauranga (Ngahauranga).

29.—WEST INDIES.—*Venezuela.—Oruba Island.—Temporary light on Point del Cerrito Colorado.*—A harbour light is temporarily exhibited by the Aruba (Oruba) Phosphate Company, from an iron framework on Point del Cerrito Colorado, eastern extremity of Oruba island. The light is a *fixed white*, visible seaward between the bearings of N.W. and S.W., and obscured in all other directions by the land. It is elevated 130 feet above the sea, and should be seen from a distance of 9 miles. Position approximate, lat. 12° 24′ N., long. 69° 56′ W. *Variation*, 8° *E.*

30.—*United States.—Virginia.—New Lighthouse at Cape Henry.*—On and after December 15, 1881, the light at cape Henry, mouth of Chesapeake bay, would be shown from the new tower recently erected. It is also changed to a *first*-order, *fixed white*, illuminating 270° of the horizon; elevation 152 feet above the ground and 160 feet above low water; and visible from a distance of 19 miles. The structure is an octagonal tower; the base, service-room, and lantern, black; the shaft coloured on each face half white and half black, alternating, so that the upper and lower halves of the faces show alternately black and white. Approximate position, lat. 36° 55″ 29″ N.; long. 76° 0″ 32″ W. The old

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tower, which will remain as a day-mark, is 840 feet from the new one, bearing S.W. by W.

31. — NEWFOUNDLAND. — *South Coast.* — *Langlade (Little Miquelon) Island.—Fog-Signal at Plate Point.*—Established at Plate point, on the S.W. side of Langlade (Little Miquelon) island, Miquelon islands. The signal is a siren, which, during thick weather, fogs, or snowstorms, will be sounded *twice every minute* as follows—sound for *seven seconds*, silence *nine seconds*, sound for *seven seconds*, followed by silence of *thirty-seven seconds*.

Note.—This siren produces a trembling sound, which is shriller than that of the fog-signal on Galantry head, St. Pierre island.

32.—NEWFOUNDLAND.—*South Coast.—Harbour Breton.—Rocky Point Light Re-exhibited.*—With reference to Notice in 1881, on the destruction by fire in June, 1881, of the lighthouse on Rocky point, western side of entrance to harbour Breton, the light is now re-exhibited from a tower since erected. It is a *fixed white* light, elevated 68 feet above the sea. It is obscured in the direction of Harbour rock, which bears N.E. $\frac{3}{4}$ E. from the lighthouse, distant 230 yards. The lighthouse, circular in shape and constructed of iron, is painted red and white in alternate horizontal bands. Position as given, lat. 47° 27′ 30″ N., long. 55° 47′ 45″ W. *Variation*, 29$\frac{3}{4}$° W.

33.—NEWFOUNDLAND.—*South Coast.—Shoal sounding on Green Banks.*—The master of a Norwegian barque reports that while on passage to Quebec, and in lat. 45° 45′ N., and long. 54° 20′ W., (bearing S.W. *true*, distant 25 leagues from Cape Race), soundings were obtained in 5 fathoms ; the bottom being soft and muddy.

34.—NEWFOUNDLAND. — *East Coast.—Trinity Bay.—Light at Hants Harbour.*—Exhibited from a lighthouse erected on the north-east head, Hants harbour, eastern side of Trinity bay. It is a *fixed red* light, elevated 65 feet above the sea. The lighthouse consists of a wooden octagonal tower on a square base ; the buildings are painted white. Position, lat. 48° 1′ 5″ N., long. 58° 15′ 5″ W.

35.—CANADA.—*Gulf of St. Lawrence.—Prince Edward Island. Light on Cape Bear.*—Exhibited from a lighthouse erected on the headland of cape Bear, S.E. side of Prince Edward

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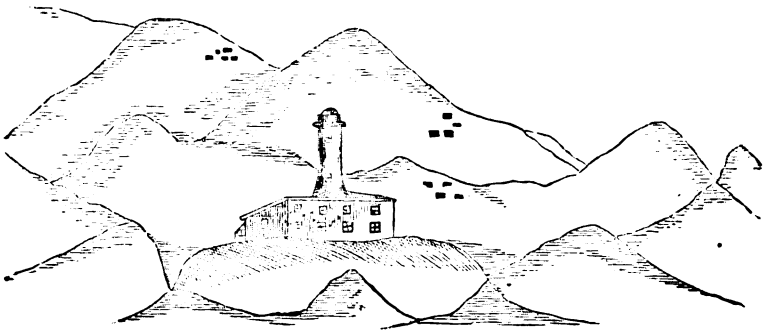
island, Northumberland strait. It is a *revolving red* light, attaining its greatest brilliancy *every thirty seconds*, elevated 74 feet above high water, and visible from a distance of 12 miles. The lighthouse, 46 feet high, consists of a square tower, constructed of wood and painted white, with dwelling attached. Position, lat. 46° 0′ 35″ N., long. 62° 27′ 15″ W.

36.—CANADA.—*Gulf of St. Lawrence.—Scatari Island.—Fog-Signal near Scatari Lighthouse.* — On the eastern point of Scatari (Scatterie) island; the signal is a steam whistle, which during thick weather, fogs, and snowstorms, will sound *two blasts* of *five seconds* duration, with an interval of *ten seconds* between them, *every minute.*

37.—CANADA.—*Nova Scotia.—S.E. Coast.—Light on Jeddore Rock.*—A *fixed red* light, elevated 86 feet above high water, and visible 12 miles, has been established on this rock, about 22 miles eastward of Halifax harbour. Further particulars next month.

MEDITERRANEAN.—*Pantellaria Island.*—Capt. G. H. J. Baker, s.s. *Amoor*, furnishes the annexed sketch of a light tower he recently saw on Pantellaria island, bearing S.W. by compass, distant 4 miles, but of which he could find no record on the chart



or in the Admiralty lights list. It is presumably the tower for the light some time since announced as about to be established on Curitia point, on the N.E. side of Pantellaria island, in about lat. 36° 49′ N., long. 12° 1½′ E., as given in French Light Lists, and Imray's "Lights of the World."

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OUR OFFICIAL LOG.

Official Inquiries at Home, 1881.

1141. *Copeland*, s.s.; built at Glasgow, 1874; owned by the Clyde Shipping Co.; tonnage, 438; Greenock to Cork; passengers and general cargo; stranded on Ballyhalbert Point, Co. Down, October 8, 1881. Inquiry held at Glasgow, November 4, 1881, before Swan and Hamilton, Justices; Murdoch and Comyn, N.A. Master in default for neglecting the lead. Certificate suspended for three months.

1143. *Ludworth*, s.s.; built at Whiteinch, 1866; owned by Messrs. Green and Holland; tonnage, 304; Hartlepool to London; coals and passenger; sprung a leak and was beached, and subsequently became a total wreck, October 2, 1881. Inquiry held at Westminster, November 4, 1881, before Rothery, Wreck Commissioner; Beasley and Ronaldson, N.A. Master guilty of an error of judgment only. Certificate returned.

1144. *Lebu*, ship; built at Dundee, 1868; owned by Mr. S. Williamson and others; tonnage, 725; Maryport to Cardiff; ballast; stranded and abandoned in Douglas Bay, 20th October, 1881, when loss of life ensued, vessel since towed into Cardiff. Inquiry held at Liverpool, November 9, 1881, before Raffles, Judge; White, Wilson and Harland, N.A. Abandonment necessitated by stress of weather. Loss of life due to the accidental capsizing of the lifeboat.

1145. *Southborne*, s.s., built at Sunderland, 1881; owned by Mr. D. P. Garbutt; tonnage, 1,347; Montreal to Avonmouth; general cargo and live stock; lost near the Little Miquelin Island, Newfoundland, August 7, 1881. Inquiry held at Hull, November 9, 1881, before Twiss, Judge; Anderson and Hyde, N.A. Loss due to a dense fog, and to an unusually strong current setting to the northward. Court considered the master greatly erred in judgment in running at full speed in a fog, without making allowance for current.

1147. *St. Lawrence*, barque; built at Prince Edward's Island, 1871, owned by Messrs. Richards; tonnage, 884; Newport to Rosario;

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iron rails; abandoned at sea, September 9, 1881. Inquiry held at Swansea, November 12, 1881, before Fowler, Judge; Foster and French, N.A. Court found that the abandonment was somewhat premature, but refrained from dealing with the master's certificate.

1150. *Corsica*, s.s., built at Govan, 1863; owned by the Bristol Steam Navigation Company; tonnage, 1,042; London to Bombay; general cargo; lost off Cape Roca, Portugal, October 11, 1881. Inquiry held at Westminster, November 8, 1881, before Rothery, Wreck Commissioner; Aplin and Curling, N.A. Loss occasioned through the master starboarding his helm, in order to shape a course for Cape St. Vincent before he was well past Cape Roca. Master and officers all drowned.

1151. *Iron Crown*, barque; built at Jarrow, 1862; owned by Mr. T. Shallcross; tonnage, 994; Hamburg to the Tyne; ballast. Lost on the Black Middens, October 21, 1881. Inquiry held at North Shields, November 9, 1881, before Cleugh and Green, Justices; Parfitt and Kennedy, N.A. Loss caused by the master's inability, through stress of weather, to obtain a pilot, and from the parting of the cables when the anchors were let go. Master's certificate not dealt with,

1152. *Rothbury*, snow; built at Hylton, 1867; owned by Mr. J. Gibson; tonnage, 246; Blyth to Reckiariak; coals; stranded near Reckianaes Cape, September 28, 1881. Inquiry held at North Shields, November 12, 1881, before Cleugh and Hedley, Justices; Hight and Methven, N.A. Stranding due to the master mistaking one island for another, but it being proved that he was unable to procure a proper chart, his certificate was not dealt with.

1154. *Pacha*, s.s.; built at Renfrew in 1855; owned by Mr. R. Taylor and others; tonnage, 406; Burntisland to Cronstadt; coals; abandoned at sea, October 16, 1881. Inquiry held at Dundee, November 19, 1881, before McGavin and Cox, Judges; Ward and French, N.A. Master in default, but the Court decided that the justice of the case would be met by reprimanding him for carelessness, and cautioning him to be more careful in future.

1155. *Eveline*, ship; built at Quebec in 1853; owned by Mr.

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W. Lindsay; tonnage, 779; Quebec to Leith; timber; abandoned at sea, waterlogged, October 22, 1881. Inquiry held at Greenock, November 23, 1881, before Neill and Leitch, Justices; Beasley and Anderson, N.A. Abandonment justifiable.

1156. *Cyprian*, s.s.; built at Seacombe, Chester, in 1874; owned by the Cyprian Company (Limited); tonnage, 940; Liverpool to the Mediterranean; general cargo; lost in Carnarvon Bay, October 14, 1881, when loss of life ensued, including the master. Inquiry held at Liverpool, November 16, 1881, before Rothery, Wreck Commissioner; Moresby, Castle, and Hallett, N.A. Loss caused by the water having been allowed to get into the stokehole through the fiddley gratings and through the alleyways, which might have been closed earlier; this put out the fires, and the vessel then becoming unmanageable, was driven by the gale into Carnarvon Bay.

1157. *Drumtochty*, s.s.; built at Montrose, 1877; owned by Mr. W. H. Raeburn and another; tonnage, 126; Duddon to Troon; iron ore; stranded on Mill Rock, Troon Bay, November 5, 1881. Inquiry held at Glasgow, November 26, 1881, before Rothery, Wreck Commissioner; Curling and Hyde, N.A. Master was somewhat misled by the colour of the buoys, but was to blame for proceeding without a pilot. Certificate not dealt with.

1158. *Clan Macduff*, s.s.; built at Whiteinch, 1870; owned by Messrs. Cayzer, Irvine and Company; tonnage, 1,496; Liverpool to Bombay; general cargo, coals, and passengers; abandoned and lost in the Irish Sea, October 21, 1881, when 31 lives were lost, including the master. Inquiry held at Liverpool, November 22, 1881, before Rothery, Wreck Commissioner; Moresby, Castle, and Hallett, N.A. Loss occasioned by the water getting into the engine-room through the fiddley gratings and afterwards through a rent in the fiddley house, and to the pumps becoming choked which caused the furnaces to be put out, and the vessel falling into the trough of the sea became unmanageable. Master to blame for neglecting to secure the fiddley gratings, &c., and for bringing the vessel up to the wind when he did, knowing that the engines were powerless.

1159. *Liffey*, barque; built at New Brunswick, 1877; owned

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by Mr. G. Carvill and another; tonnage, 845; St. John's to Liverpool; deals; lost near Kilmore Pier, Co. Wexford, November 2, 1881. Inquiry held at Liverpool, November 23, 1881, before Rothery, Wreck Commissioner; Comyn and Clarke, N.A. Master in default for negligent navigation, in mistaking the Coningbeg Light for the Tuskar, and for laying the vessel on an up Channel course without verifying his position by a cast of the lead. Certificate suspended for three months.

1160. *Rodell Bay*, barque; built at Govan, 1877; owned by Mr. J. S. Hatfield and others; tonnage, 1,079; San Francisco to Queenstown; wheat; supposed to have foundered at sea. Inquiry held at Glasgow, November 25, 1881, before Rothery, Wreck Commissioner; Pickard and Parfitt, N.A. No evidence before the Court to show what had become of the vessel.

1161. *Ganges*, ship; built at Sunderland in 1861; owned by Mr. J. Nourse; tonnage, 1,106; Middlesborough to Calcutta; iron goods; lost on the Goodwin Sands, October 14, 1881, when loss of life ensued. Inquiry held at Westminster, November 11, 1881, before Rothery, Wreck Commissioner; Powell, Parish and Vaux, N.A. Loss due in the first place to the shifting of the cargo and to the parting of the hawser by which the tug was endeavouring to bring the ship to the wind. Master to blame for cutting the lashings of the shifting boards. His certificate was not however dealt with.

1162. *Matthew Curtis*, s.s.; built at Hartlepool, 1878; owned by Messrs. John Fry and others; tonnage, 1,254; Calcutta to Dundee; jute; lost near Ras Jerred Haffun, East Coast of Africa, October 8, 1881. Inquiry held at Cardiff, November 29, 1881, before Phillips and Alexander, Judges; Foster and Vaux, N.A. Master in default for the negligent manner in which he navigated the vessel. Certificate suspended for six months.

1166. *Morven*, s.s.; built at Hartlepool, 1880; owned by Mr. W. G. Gardiner and others; tonnage, 869; Kotka, Gulf of Finland to London; deals and battens; stranded on Hammond's Knoll, Coast of Norfolk, November 8, 1881. Inquiry held at Westminster, December 2, 1881, before Rothery, Wreck Commissioner; Harland and Anderson, N.A. Master to blame for neglecting the

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lead and for making no allowance for set of the tide. Certificate suspended for three months; recommended for one as mate.

1167. *Verulam*, barque; built at Greenock, 1876; owned by Mr. D. King and others; tonnage, 833; Mauritius to London; sugar and rum; abandoned at sea, October 23, 1881. Inquiry held at Westminster, December 1, 1881, before Rothery, Wreck Commissioner; Ronaldson and Parish, N.A. Loss due to stress of weather. Abandonment quite justifiable.

1170. *Aristides*, s.s.; built at Liverpool, 1881; owned by the Steamship Aristides Company; tonnage, 986; Odessa to Liverpool; grain; struck on a rock W. of Cape Blanes, Tunis, and subsequently lost near Ros Engelah, October 15, 1881. Inquiry held at Liverpool, December 5, 1881, before Raffles, Judge; Wilson and Methven, N.A. Master in default for navigating too close in shore. Certificate suspended for six months.

1171. *Cumeria*, barque; built at Birkenhead, 1,869; owned by Messrs. Nicholson and others; tonnage, 1,284; the Tyne to Bombay; coals. Inquiry as to the loss of 4 men overboard off St. Catherine's Point, Isle of Wight, February 7, 1881, before Rothery, Wreck Commissioner; Knox, Ronaldson, and Kennedy, N.A. Casualty due to the vessel broaching to in consequence of the foretopmast-staysail sheet giving way, and to a heavy sea striking the vessel forward at the same instant, washing overboard the hands who were engaged in furling the jib.

1172. *Thomas Cochran*, barque; built at Dorchester, New Brunswick, 1867; owned by Mr. W. K. Chapman and others; tonnage, 627; Leith to Demerara; coals; lost south of Don Mouth, near Aberdeen, November 20, 1881. Inquiry held at Leith, December 8, 1881, before Wilkie and Wilson, Judges; Hight and Ward, N.A. Master in default for bringing up his vessel in an unsafe position. Certificate suspended for three months.

1174. *Kilmodan*, ship; built at Port Glasgow, 1881; owned by Mr. William Newton and others; tonnage, 1552; Port Glasgow to San Francisco; coals; took fire and abandoned at sea, August 31, 1881. Inquiry held at Glasgow, December 8, 1881, before Waddel and Smith, Judges; Forster and Curling, N.A. Fire caused by spontaneous combustion of coal cargo. Abandonment justifiable.

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1175. *Acacia*, s.s.; built at Port Glasgow, 1879; owned by Mr. G. Kerr; tonnage, 268; Maryport to Riga; pig iron; stranded at Hesseloen, Bornholm, September 20, 1881. Inquiry held at Glasgow, December 9, 1881, before Mac Lean and Marshall, Judges; Parfitt and Parish, N.A. Master guilty of an error of judgment only. Certificate not dealt with.

OFFICIAL INQUIRIES ABROAD.

1142. *Neera*, s.s., and *Cashinath*, pattimar. In collision off Ratnagiri, April 9, 1881. Inquiry held at Bombay, September 21, 1881. Collision due to the pattimar being entirely without lights; no blame attached to master of *Neera*.

1146. *George Mills*, barque; stranded between the Narcisse and Rouen Banks; August 10, 1881. Naval Court held at Monte Video, October 8, 1881. Vessel struck on an unknown shoal. Master exonerated.

1148. *City of Brisbane*, s.s., and *Newcastle*, dredge. In collision off Dyke Wharf, Newcastle, August 17, 1881. Inquiry held at Newcastle, September 12, 1881. No charge of default preferred against master.

1149. *Boomerang*, s.s., and *Duckenfield*, s.s. In collision off the entrance of the Port, August 20, 1881. Inquiry held at Newcastle, September 28, 1881. Master of *Duckenfield* to blame—censured.

1153. *Govino*, s.s.; lost on the English Bank, River Plate, October 5, 1881. Naval Court held at Monte Video, October 15, 1881; loss due to negligent navigation. Master and mate reprimanded and cautioned to be more careful in future particularly as regards the use of the lead.

1163. *Fernglen*, ship; lost on Clatsop Spit, October 18, 1881. Naval Court held at Portland, U.S.A., October 27, 1881. Master to blame for standing on towards the land until the ship was in broken water. Certificate suspended for four months.

1164. *Lizzie Fennell*. Burnt and abandoned at sea, August 21, 1881. Naval Court held at Valparaiso, October 18, 1881. Fire caused by spontaneous combustion of coal cargo. Abandonment justifiable.

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1165. *Alverton*, s.s.; lost on the rocks near Mugia, November 11, 1881. Naval Court held at Coruna, November 18, 1881. Loss due to an error in judging distance, to an easterly current and probable unknown deviation of compass.

1168. *Glamorganshire*. Stranded on the Hills Bank, near Dunkirk, November 26, 1881. Naval Court held at Corfu, December 2, 1881. Master censured, and recommended to be more careful in future.

1169. *Wellington*, barque; lost at the entrance of the Bay of Yedo, September 14, 1881. Naval Court held at Kanagawa, September 29, 1881. Master exonerated.

1173. *Euro*, s.s.; lost near Beachport, Rivoli Bay, August 24, 1881. Inquiry held at Port Adelaide, October 28, 1881. Casualty possibly due to the ship striking a rock not marked on the chart. Certificate not dealt with.

GENERAL.

West Indies.—Hayti.—*A port closed.*—Anse d'Hainault has been closed to foreign trade. Eleven other ports remain open, viz.:—Port au Prince, Cap-Haytien, Aux Cayes, Jacmel, Jeremie, Miragoane, Petit Goaves, Port de Paix, Gonaives, St. Marc, and Aquin.

United States Meteorological Notice.—General Hazen, Chief Signal Officer of the United States, has established a Marine Agency in New York at the Maritime Exchange, where masters of vessels are furnished with meteorological and signal publications free. Forms are supplied to those masters who will record one observation daily at 12·08 p.m., Greenwich time, for the International Bulletin. Shipmasters of all nations are invited to co-operate. Barometers will be compared with the United Signal Service Standard when desired. Shipmasters will give valuable aid by sending meteorological data that they may collect, to the Signal Service, Washington.

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Lights and Shoals.—(See letter to Editor, page 940, volume 1881.)—The official notice respecting Maretimo island light describes it as flashing every *four* minutes; if the machinery is out of order the time might be less or more; the chart could not indicate irregularities of this kind. Melville shoal and La Secca bank are two different names for the same shoal spot; there are not two shoals.—Ed. *N. M.*

Telegraphic Communication Between Lightships and the Shore.—The general public do not understand the practical difficulties which attend the maintenance of a submarine telegraph cable between a lightship and the shore. It appears to be such a simple matter and so easy of accomplishment that it is regarded as at least surprising, if not culpable, that the arrangement has not long since been carried into effect. On this point we hope to offer a few remarks in our next number, but meanwhile we are glad to be able to state that the Board of Trade and Trinity House being earnestly desirous of establishing such communication in the interest of shipping generally, have resolved to make an experimental trial of a scheme for connecting the Sunk light-vessel off Harwich with the shore by means of a telegraphic cable. The practical part of the undertaking is, we believe, in the hands of the officers of the Telegraph Construction and Maintenance Company. It is probable that the experiment will extend over some time in order that all sorts and conditions of weather may be experienced, and the general behaviour of the vessel under the most trying circumstances ascertained.

Naval and Submarine Engineering Exhibition. — From April 10th to April 20th, an exhibition will be held at the Agricultural Hall, Islington, of objects ilustrating mechanical contrivances and appliances employed in or connected with the construction and equipment of ships of all classes. A prize of one hundred guineas is to be given for the best means of saving life in cases of shipwreck, and another of fifty guineas for the best invention of a humane character connected with seafaring. A large tank will be provided for the exhibition of submarine operations. A course of lectures on naval architecture, mechanics, and other cognate subjects will be delivered during the exhibition.

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THE

NAUTICAL MAGAZINE

FIFTY-FIRST YEAR.

VOLUME LI.—No. II.

FEBRUARY, 1882.

MERCANTILE MARINE EXAMINATIONS.

AT a time when the Board of Trade have issued a new form of "Examination I.—Regulations relating to the Examinations of masters and mates in the Mercantile Marine," it is pertinent to the subject to inquire to what extent the examinations have been effective in fostering the education of officers of the Merchant Service. Prior to January, 1851, the examinations had been voluntary, but subsequent to that date they became compulsory for certain grades of officers of foreign-going ships. Surely the system established thirty-one years ago must have been productive of some visible effect, either for good or bad.

We are well aware that at different times since 1851, it has been stated by some parties that the system has been productive of essential benefit, by others, on the contrary, that it has been prejudicial. As a matter of fact, the result has been not nearly so good as the first would have us believe, nor so bad but that it might have been much worse. The argument that a totally ignorant man, one who cannot write his name, is not now to be found in command of any foreign-going or home-trade passenger ship, is utterly futile as indicative of progress; were this alone the

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outcome of an educational system running through thirty-one years, then we should say the system had failed. We must look for the standard of progress in another direction, and on another basis.

In the Board of Trade circular of 1850, which instituted the examination of masters and mates, appeared a notable cautionary paragraph which is worth quoting.—"The qualifications have been kept as low as possible; but it must be distinctly understood that it is the intention of the Board of Trade to raise the standard from time to time, whenever, as will no doubt be the case, the general attainments of officers in the Merchant Service shall render it possible to do so without inconvenience: and officers are strongly urged to employ their leisure hours, when in port, in the acquirement of the knowledge necessary to enable them to pass their examinations: and masters will do well to permit apprentices and junior officers to attend schools of instruction, and to afford them as much time for this purpose as possible." It is in the realization of this programme that the failure has occurred: and we purpose briefly to show to what extent the examinations have been and still are ineffective in producing good navigators.

The problems that constitute the first day's examination at present are those with which the system was initiated. A slight addition, of recent date, to the end of the amplitude azimuth and also to the chronometer problems, can scarcely be said to have altered their character. The principal change that has occurred has been a shuffling of these problems, and a re-distribution of them, so that the lower grades of officers now work more of the set than the same grade worked in the past. The worst feature of the set is that it is never varied, which it might well be in the direction of navigation. None of those that relate to nautical astronomy could be dispensed with, but it is inconceivable that the wording of some of them should be of a character to utterly puzzle anybody but the "coach" who necessarily must acquire an aptitude in interpreting the intent and meaning of any new problem that may be introduced from time to time.

As an instance in point take the chronometer problem. It is equally well devised to mystify a navigator who has a thorough knowledge of relative times, and to

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inculcate in the novice ignorance of the sea use of a chronometer in reference to the Greenwich date. The first, when at sea, instinctively knows from the approximate time at ship and the position whether it be a.m. or p.m. at Greenwich, whether in fact he should use the time by chronometer as indicated on its face, or increase the hours by twelve ; the value of the chronometer problem rests on such knowledge, but there is nothing in the examination question to throw any light on this important point. Say that both men are applicants for a certificate of competency and have been "coached" for the examination. Both will have been told not, under any circumstances, to alter the Greenwich time as given in the problem, except for error and rate. The one accustomed to careful navigation will probably smile at the idea of finding the time at ship and longitude after so blind a fashion. The novice knowing no better, thinks he is acquiring a knowledge of a valuable nautical problem. Both present themselves at the Board for examination. The first makes a clerical error, which, on going through his work, he does not perceive, and the result not being within the required mile of position, he is "failed" for a week. The novice makes no clerical errors and passes with credit. So much for the value of the examination. But our novice is now an officer and soon after leaving the channel, is told "to work up the sights:" he does so, "Board of Trade fashion" as he says, and gets App. T. at ship 21 hours ; the time by chronometer, as read, gives 10 hours ; following his rules, 10 from 21 gives 11 hours = 165° E., and he wonders what legerdemain of figures places the ship in the Pacific when he knows she is in the Atlantic. Did not this sort of thing often occur, and within our own knowledge, we should not have given the case. As a matter of fact the officer holds a certificate indicative of an amount of knowledge in Navigation and Nautical Astronomy that he does not possess ; and this, to his disgust, he soon finds out ; in the instance narrated above he is unable to interpret the indications of the chronometer relatively to the approximate place of the ship.

The Examining Board may retort, "In what other form can we put the problem so that we may know that the candidate can

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correctly find a longitude and *name* it." To this we reply—"easily enough."

"The astronomical date at ship is ———, and the astronomical date at Greenwich is ———; in what longitude is the ship? Explain the astronomical dates, and give the respective civil dates for each place." This understood by the candidate, the chronometer problem might then be given in the form in which it presents itself at sea—and he would understand what he is doing, which he does not at present. The ex-meridian problem equally requires amending.

The strained wording of a problem for the purpose of testing the candidate's ability to solve it, is not, however, the worst feature of the examination. The additions in recent years have lain in the direction of the Definition of Terms in Navigation and Nautical Astronomy, the Adjustments of the Sextant, Examination in Chart, the Deviation of the Compass, and the "Sumner" Problem. The latter is a good introduction, but might with advantage be utilized in connection with the Time Azimuth Tables. Of the other subjects we count no less than the equivalent of 84 questions, all or any of which must be answered in writing, the number being selected according to the grade of certificate required. The system of written answers in relation to every subject was introduced for the sake of uniformity in the examination-room in every port where there is a Local Marine Board. But there may be uniformity of ignorance as well as of knowledge; the precise form of question being known, and the equally precise form of answer that will be received being known, the examination has degenerated into a parrot-like exhibition totally devoid of intelligence; in connection with which the majority have long since ceased to study navigation, nautical astronomy and compass deviation; preferring rather to pay a coach for the simple process of preparing them for the examination of the grade to which they are by service entitled.

Nor are the men wholly to blame; the Board of Trade have departed from their programme of 1850. The tenor of the examination in the nautical problems is sufficiently expressed in the

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following paragraph :—" Candidates are expected to work out their answers to all problems to within, or not to exceed, a margin of one mile of position, from a correct result." Nothing is allowed to knowledge ; the candidate that understands his subject but makes clerical errors, stands lower than the one who having learnt everything by rote, and knowing the rules through mere mechanical repetition, yet understands nothing, or at least very little, and makes no *arithmetical* blunders.

Until a total change takes place the examination, as a test of knowledge, will remain what it is—not worth the paper it is written upon. The change must be in the direction of inducing—nay, of compelling the men—to cultivate a *knowledge* of the subjects in respect to which they are to be examined—Navigation, Nautical Astronomy, Magnetism, &c. We do not want more questions, rather less, but extending over a wider range, but the less done with more intelligence. The only way to effectually cure the existing evil in the system is to commence at an early date by throwing the onus of examination on the second mates, gradually extending it to the higher grades ; and to make it to embrace the theory as well as the practice of every subject.

ROUTES FOR STEAMERS FROM ADEN TO THE STRAITS OF SUNDA AND BACK.

THE Director of the Marine Department of the Royal Meteorological Institute of the Netherlands at Utrecht, Baron P. F. van Heerdt, has lately published in Dutch and French under the title "Route voor Stoomschepen van Aden naar Straat Sunda en terug," Utrecht, 1881, a summary with charts, of the best routes for steamers between Aden and the Straits of Sunda, for different seasons of the monsoon period and the intervening months, based upon an examination of the log books of Dutch vessels. We reproduce Baron van Heerdt's introductory remarks, together with a summary of the routes recommended.

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After the establishment of the *Nederland* Company in 1871, for the passage from Holland to Java through the Suez Canal, and when the number of Dutch steamers making the same voyage increased, the necessity of sailing directions referring to the route between Aden and the Straits of Sunda, made itself felt. Considering the small number of vessels which had frequented this part of the Indian Ocean before the cutting of the Suez Canal, it was impossible to lay down this route from actual data; so that the publication of the Director of the Marine Department at that time, M. Cornelissen,* was rather a theoretical route, than the practical result of voyages previously made, with the exception of the table of winds of the Indian Ocean which was drawn up from the logs of 366 sailing vessels.

Generally speaking, this publication was taken as a guide by Dutch captains, although some of them often departed materially from its instructions. It was this fact which rendered possible the comparison of the routes laid down in 1871 with the actual voyages, which could not have been done if the captains had always followed the prescribed routes.

Some remarks upon the route to be followed in the month of April, received from M. van den Sprenkel, captain of the Dutch steamer *Prins van Oranje*, suggested the idea of deducing the best routes of the Dutch steamers from which the logs had been received at the Institute.

Although the number of logs is still rather small for indicating this route in an absolute manner by themethod which was followed for the *general* routes from the Channel to Java, yet the result is rather satisfactory.

In the discussion of the *general* routes referred to, the points at which the various crossings were made, and the times occupied, were tabulated, and from a mean of these, the most favourable routes were laid down. It would have been desirable to have made the examination for each separate month, with the view of combining subsequently the months in which the same route may be taken. This was unfortunately impossible, owing to the few

* "Route voor Stoomschepan," &c., Utrecht, 1871. See translation published by authority of the Meteorological Committee, London, 1872.

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voyages in each month; so that those months in which the same monsoon prevails have been combined. For the same reason the month of March in which the monsoon changes, and which month had been treated separately in the previous publication, is now joined to the winter months. The result of the investigation is that the route laid down in 1871 from the Straits of Sunda to Aden, for the months of July, August, September, and October, is in fact advisable (see III. *b.*, and IV. *b.*, mentioned below), while in the months of April, May, and June, it is better to take the route to the north of the Chagos Islands than that to the south of those islands, and not cross the Equator between long. 60° and 65° E. rather than to the west of 60° E.

For the months of November until April, it has been found that the nearly direct route from the Straits of Sunda to Aden is the most favourable, and as far as the relatively small number of voyages allows of conclusions being drawn, it appears that the route to the N.W. along the coast of Sumatra, in the N.E. monsoon is useless, and only prolongs the track unnecessarily.

Although the number of voyages in March was too small to treat that month separately, yet the figures show pretty clearly that in this as in the other winter months, the direct route was the best, so that there was no inconvenience in combining them.

For the outward voyages, Padang has been taken as the point of destination, because almost all vessels touch at this port before proceeding to Batavia. The examination of these outward voyages was less favourable, because all the vessels followed the routes given in 1871. Some ships in the months of November to April have made an exception to this rule, by following a more northerly route and passing close to the south of the Maldive Islands, by which they gained ½ or ¾ of a day in the duration of the voyage.

While in September and October, all vessels followed the prescribed route, the steamer *Friesland* deviated from it, crossing the Equator in long. 70° E., gained the Padang roads by a direct course to the east, keeping in ½° S. lat., which gave it an advantage of one day on the mean of all the other vessels. This route, however, is not recommended without reserve, because no other vessel has made the experiment.

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The following are the results of the voyages of ships crossing the different meridians :—

I. *November to March.* (*a.*) *From Aden to Padang:* 39 logs of steamers.—Although the result shows that the vessels which from 80° E. long., keep to the north of 2° S. lat. have the best voyages, it should be mentioned here that the highest north latitude was 2° N., in 85° E. long. In all cases preference should be given to the mean route. The route may be summed up as follows :—From the Aden roads a route should be taken between Cape Guardafui and Socotra Island towards a crossing between 3½° and 5° N. lat. on the meridian of 60° E. The equator should be crossed between 66½° and 69° E. long., and 80° E. long. between ½° and 2° S. lat., and from thence an easterly course should be made as far as the Padang roads. In going to Java an easterly course should be steered as far as 90° E. long.; to take from there a direct route towards the Straits of Sunda.

(*b.*) *From the Straits of Sunda to Aden:* 27 voyages homeward in the N.E. monsoon.—The nearly direct route, from the Straits of Sunda to Aden, passing close to Ceylon, is the most advantageous, and it is useless, on leaving Padang to stand to the N.W., keeping near the isles on the coast of Sumatra, as far as 90° E. long. before continuing the voyage, by steering to the west. In fact, while the vessels which crossed the meridian of 95° E. long. between 3° and ½° S. lat. and that of 90° E. long. between ½° S. lat. and 3° N. lat., reached this point on an average respectively in 2·8 and 4·2 days, the ships which reach these same meridians between ½° S. lat. and 2½° N. lat. and 3° and 6½° N. lat. took 3·8 and 5·8 days for the same passage. Further, from the two above named meridians, the ships which were more to the south, arrived at Aden in 12·9 days and in 11·4 days; against 13·7 and 11·9 days which the others took to reach that port. Hence, an attempt should be made to cross the equator between 91½° and 93½° E. long. and the meridian of 80° E. long. between 5° and 5½° N. lat. From this point a route should be taken to the south of Minikoy towards a point between 10° and 10½° N. lat on the meridian of 65°, and to the north of Socotra towards Aden.

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II. *April, May and June.* (*a.*) *From Aden to Padang:* 31 logs. — The data show clearly that the best route in these months is almost a straight line between Socotra and the Straits of Sunda as far as the equator at about 95° E. long.; whence a straight course may be steered to the Padang roads, passing between the Mentawie islands. On proceeding to Java, bearings can easily be taken at the island of Engano.

(*b.*) *From the Straits of Sunda to Aden:* 23 logs.—As before said, the investigation shows that the route to the north of the Chagos Islands is preferable at this time of year to that to the south of those islands; therefore, on leaving the Straits of Sunda, the course should be shaped to cross between 1° and 3° S. lat. on the meridian of 70° E.; passing the equator between 60° and 65° E. long., and from thence to stand on a straight line to Aden, passing between Socotra and Cape Guardafui.

Two vessels took a much more northerly route, one standing straight for Point de Galle, and from that port direct for Aden, crossing the meridians of 90° and 85° E., in 1½° S. lat., and 80° E. long. in 6° N. lat., thence proceeding towards Aden by passing through the "one and a half degree" channel, to the south of the Maldive Islands, and even keeping in this latitude as far as 60° E. long. The first of these two vessels had a pretty good, and the other a very long passage. The difference of the passage of vessels passing to the north and to the south of the Chagos Islands is about one day. The number of days taken to reach to the meridian of 70° E., was the same in both cases, but vessels passing to the south of the islands took a day longer in reaching Aden.

III. *July and August. From Aden to Padang:* 20 logs.—The most favourable route for the first part, is to the north of Minikoy, and from thence in a direct line towards a point on the equator in 95° E. long. In proceeding from the Straits of Sunda, a route should be taken from 95° E. long. towards the Flat Point of Sumatra, instead of standing to the east towards the Peking roads. Although the difference is not great, the vessels taking the more northerly route make on an average the best passages. It is to be remarked, however, that the crossing of the vessel which was furthest to the north, has been taken as the northernmost limit of

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the route, so that it is not yet proved whether it is preferable to take a more northerly route.

(*b.*) *From the Straits of Sunda to Aden:* 19 logs.—The examination of the logs shows that the route recommended in the publication of 1871, viz.: to take a course to the northward of the Chagos Islands until the S.W. monsoon is met, and then steer for Aden between Socotra and the coast of Africa, is in fact the best; some vessels took the route to the south of the Chagos Islands, but were generally one day longer than those which kept to the north of them; for the passage to Aden, it is considered preferable, however, not to cross the equator too much to the east, but between 57½° and 59° E. long.

The directors of the *Compagnie des Messageries Maritimes* sent into the Institute twenty of the logs of their steamers which make regular passages between Aden and Singapore, through the Straits of Malacca. These vessels always take the direct route from Aden to Point de Galle, and from thence towards the northern point of Sumatra. On the homeward voyages they also follow a direct line across the Bay of Bengal to Point de Galle, but in the S.W. monsoon (May to August) they generally take the route from Point de Galle to Aden, by passing through the "one and a half degree" channel, keeping in lat. 1° N. as far as 65° E. long., to reach Cape Guardafui by standing gradually to the N.W., so as to cross the meridian of 60° E. in 3° N. lat.; they usually make this passage in 8½ days.

In order to examine whether a route more approaching that followed by the French vessels in the above months would be preferable, Baron van Heerdt tried to find out the relation between the mean speed of the Dutch and French vessels, by comparing the time taken for the passage between Aden and the meridian of 80 E., and this was found to be as 10·7 to 12·06. According to this ratio the Dutch vessels would take about 9½ days for the passage from Point de Galle to Aden, by passing through the "one and a half degeee" channel, or for the voyage from the Channel to Aden, 7½ days. The average time of the voyages from the Straits of Sunda to Aden, by the route to the south of the Maldive Islands, which has always been followed by the Dutch

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vessels, being 17·14 days, the route through the "one and a half degree" channel would be more favourable, if the passage from the Straits of Sunda to that channel can be made in 17·14 – 7·5 = 9·64 days.

In order to find out whether it is possible to make this part of the voyage in less than 9·64 days, the time taken by the French and Dutch vessels for making a passage of the same length on the route to the north, and to the south of the equator, between the meridians of 95° and 80° E. was compared. The French vessels took 3¼ days and the Dutch vessels 3¾ days, which proves, taking into account the relation between the mean speed of the vessels, that this passage may be made in less time on the route to the south, than to the north of the equator.

The mean voyage of the Dutch vessels from the Straits of Sunda to 80° E. long. in 5° S., lat. was 6·11 days, and it may be admitted that the 540 miles from this point to the "one and a half degree" channel may be made in 2·1 days, which would give for the whole voyage from the Straits of Sunda to the above passage, 8·2 days, so that, in this manner, there would be a gain of 1¼ days on the voyage from the Straits of Sunda to Aden.

It has not been determined whether the direct route from the Straits of Sunda to the "one and half degree" channel would be still more advantageous.

IV. *September and October. (a.) From Aden to Padang.*—The routes taken by the vessels differed so little that it was impossible to deduce a favourable route, therefore reference to the publication of 1871 should be made. It was there stated that it is best to take the northern route in these months, so as to gain as much benefit as possible from the westerly winds which are increasing in force. The track runs to the north of Minikoy, and it is best to cross the equator to the eastward of 95° E. According to the weather a vessel can then run inside or outside of the Mantawie Islands, and steam into the Straits of Sunda along the coast of Sumatra.

(*b.*) *From the Straits of Sunda to Aden:* 16 logs.—Although there were but 16 voyages, the result is however very favourable, owing to the great divergence in the routes followed by the vessels. These may be divided into three distinct groups:—First, those which

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take the route to the south of the Chagos Islands as far as 70° E. long., and from thence stand for the Gulf of Aden; secondly, those which go to the north of the Chagos Islands and to the south of the Maldive Islands; and thirdly, those which take the route entirely to the north, and pass the meridian of 80° E. in lat. 6° N. Notwithstanding the few vessels available, the difference is rather considerable, and always in favour of those which keep to the south of the Chagos Islands; the parallel of 9° S. is to be considered as the extreme southern limit of this route.

In concluding the discussion, Baron van Heerdt remarks that seamen should not forget that what has been said above, although entirely based upon the logs, is the result of a relatively small number of voyages, so that the routes given by the Institute should not be regarded as absolutely and infallibly the shortest and most favourable tracks.

OUR SEAMARKS.—VII.

THE LIGHTHOUSE SERVICE.

HAVING given a general account of the methods and mechanical appliances for maintaining the illumination of lighthouses, the next point which suggests itself for consideration is in connection with the human element of the service. We have not yet arrived at the period when the lights around our shores can be simultaneously and automatically lit up or extinguished by electric agency set in operation at a central depôt; nor is it possible at present to leave the lights to take care of themselves between sunset and sunrise like so many lamp-posts. It is quite conceivable that the state of things indicated may sooner or later come into operation, and human service thereby be reduced to a minimum, but for the present the lights must be lit, watched, and put out by men employed specially to perform such duties. It will be evident that great responsibility rests upon these lighthouse keepers, for negligence on their part may be attended with disastrous consequences. A light not visible when it ought to be, expected and anxiously looked for in vain by an anxious mariner, not quite sure where he is, and

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only waiting for the appearance of the light to enable him to fix his position and to shape his course in safety, may be the cause of his vessel going ashore or at least of seriously misleading him. And it is the lighthouse keeper upon whom he is mainly dependent for keeping the lights burning. One of the first necessities which manifests itself for such a service is discipline. Carefully drawn up rules and regulations must be observed scrupulously, and punishment must immediately follow any negligence or flagrant misconduct. The men in the lighthouse service are subject to this wholesome disciplinary system, and frequent supervision by the authorities from head-quarters, or the local officials, keeps them watchful and careful. So completely is the practice of inspection carried out that it is not uncommon for official visits to be paid to the lighthouses on shore at midnight, the officials obtaining admittance by a master key; or from the steam-vessels of the authorities cruising about at night the appearance of the lights from rock lighthouses is carefully noted, and, when possible, a boat is sent off with an official who lands on the rock and inspects the establishment. Moreover the coastguard all round the coast are instructed to report any falling off or extinction of the lights within their sight, besides which the masters of passing vessels are always on the look-out and seldom fail to report any apparent negligence in regard to them. This vigilant supervision and the numerous checks on the efficiency of the service are unquestionably the prime causes of the general efficiency and trustworthiness of our coast lights.

But there are other causes which conduce greatly to the satisfactory performance of their duties by the men, viz., that they are trained up in the service, and are not sent to do permanent duty at any station until they have proved themselves competent to undertake the management of the elaborate apparatus entrusted to their charge. Further, they are in every way well cared for, well paid, and made as comfortable as the circumstances of their employment will permit. No man is admitted into the service above the age of twenty-eight, and for the first year or two he is educated in the management of the different kinds of lamps, the method of obtaining and keeping up a full-sized flame, the trimming of the

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wicks, and the management of the air supply to ensure the most satisfactory results as to burning; also how properly to clean and keep in order all the parts of the apparatus. He also has to make himself acquainted with the use of tools in carpentry and plumber's work, and of the general management of the steam-engine.

Besides receiving instruction at the central depôt, he is sent from place to place to do temporary duty at different lighthouses so that he may learn practically what he is required to do. During this period he is known as a supernumerary assistant-keeper, until the time arrives when he is pronounced efficient, and he is promoted to be an assistant-keeper. In this capacity he has to serve for many years, and at different places, and in due course arrives at the position of principal, provided his conduct has been such as to merit promotion. It will readily be understood that service at an isolated rock station is not so agreeable as at a lighthouse on the mainland, but all keepers have to take their turn at rock towers, while the veterans of the service are generally lodged in the more comfortable shore stations.

To a rock lighthouse there are attached four keepers, three always at the lighthouse, and one on shore. The regulation in force is that each keeper has to remain on duty at the lighthouse for two consecutive months, then he has a month on shore, and, by the occasional employment of a supernumerary keeper, it is so arranged that every month one of the keepers goes ashore and one returns from shore. In a land lighthouse such a method of relief is unnecessary, as each keeper has a comfortable cottage to live in with his family, which, for a time at any rate, constitutes his home. The necessity for three men being at a rock lighthouse has been more than once demonstrated. At the Smalls lighthouse many years ago when only two men were stationed there, one died, and the other, to avoid suspicion of foul play, kept the body in the tower until the relief period came round, the effluvium which filled the place being exceedingly offensive. A number of stories are told about the keepers at rock lighthouses, but they are not all true; and where there is some basis of truth it is often heightened and coloured by romance to satisfy the popular appetite for the marvellous. But life at such places is not

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without its anxieties and remarkable features. At rock lighthouses the keepers are continually in the presence of the ocean with its varying moods, and are at times involuntary witnesses of the fiercest strife between winds and waves: powerless to aid, they may at times have to behold the dread consequences of the elemental strife—to see a helpless ship breaking her bones on the cruel rocks, or hear through the storm the dying shrieks of drowning human beings. Again, they may feel their tower at times tremble with the shock of huge waves hurling themselves against the comparatively slender column of masonry, not seldom going completely over the top of the lantern. They cannot tell whether sooner or later the tower may not yield, and they, with the whole structure, be dashed to destruction. Otherwise the life is quiet and unexciting, at times even monotonous. Space is naturally very limited, walking exercise being confined mostly to the gallery outside the lantern. At some places the men can get down on to the rocks at low water and catch a few fish or occasionally a seal. The authorities give them a good deal to do to occupy their time; weather reports and daily journals have to be filled up; daily expenditure of oil, glass chimneys, or other stores, must be recorded, and everything in the establishment must be kept scrupulously clean. A look-out during the day-time has to be kept for the appearance of any of the vessels which attend on the lighthouses, in which event the flag has to be hoisted and any communication made by signal which may be necessary. At some stations systematic meteorological observations are made —while, when fog comes on, a bell or other sound producer has to be set in motion and kept going as long as the fog lasts. These numerous duties combined with the necessary operations of eating and drinking, are sufficient to fill up the day, but when sunset arrives the main purpose of their attendance has to be looked to, the lights are lit, and by an equitable division of time each keeper takes his fair share of the night-watch.

It is very seldom indeed that a rock lighthouse has proved a refuge for shipwrecked men. There are obvious difficulties in the way of its being made available for such a purpose. The sea breaking on the rock on which the tower stands is frequently of

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such force as to render it an impossibility for a human being to retain hold or footing for an instant, while the ladder of ascent to the doorway, although fixed on the lee-side of the tower, is terribly exposed and cannot be protected in any way. But nevertheless rock lighthouses are supplied with a reserve of provisions to be used in such a contingency. It is not difficult to believe that the seclusion and the novelty of the situation might be agreeable for a short time, but not so for a permanence. As a matter of fact, however, there are men who after being some time at a rock station become quite attached to it, and do not wish to leave it for one of the shore stations. It is fortunate that there are men who develope such tastes.

We have said that four keepers are attached to an isolated rock station, but in the case of a lighthouse within signal distance of dwellings on the shore three only are considered necessary, each of whom has one month ashore and two months' duty at the lighthouse, so that two men only are at the station together. At iron screw pile lighthouses erected on sand banks, the habitable accommodation is exceedingly cramped, much more so than in a stone tower. There is barely room for two men, and as such lighthouses are generally close to the track of navigation and can readily signal any urgent necessity to passing vessels, two men out of the three attached to the station remain on duty, while the third is on shore. As at rock towers, the men go ashore in rotation after two months duty at the station. The number of keepers at other lighthouses is regulated by the number and nature of the lights to be attended to, but a shore station where there is only one light, has two keepers only who perform continuous duty.

On shore, things are much more comfortable than at rock or pile lighthouses. Each keeper has a well-furnished cottage, with garden and piggery. The large majority are married men and their cottages are their homes. At many places there are, however, certain drawbacks in connection with the difficulty of obtaining school education for children, the absence of opportunities of attending a place of worship, and the difficulty of procuring medical attendance. These inconveniences arise from the necessarily isolated situations

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of the lighthouses, they being often perched on the summits of wild headlands far from towns or even villages difficult of access, and, in some cases communication having to be made by sea. But the watchful authorities do not lose sight of such matters as these, and facilities are afforded for the performance of special religious services at some of the stations, while changes are made from time to time so as to prevent a keeper with a family of young children being detained for a lengthened period at a very remote or inaccessible lighthouse. Wherever it is practicable a medical man residing in the vicinity is regularly appointed to attend on the keepers, but in some instances this is simply impossible. All lighthouses however, both shore and rock stations, are furnished with a medicine chest with full directions as to how and when the drugs, &c., are to be employed, the scale of medicines, &c., being in accordance with that required by the Board of Trade to be kept on board British merchant ships in pursuance of the Merchant Shipping Act of 1854, cap. 104 sec. 224.

But there are other varieties besides the rock and shore lighthouses. An electric light-station necessitates the employment of machinery, consequently a skilled engineer is placed in charge of such an establishment. He has a number of assistant keepers under him who have to stoke the fires and attend to the engines, electric machines, &c., besides taking their watches at night in turn. The pay at an electric establishment is higher than at an oil station, in consideration of the additional labour entailed, and the additional knowledge with which the men have to possess themselves in regard to the motor engines and the machines for generating electricity. The engineer in charge supervises the working of the whole place, and sees that his assistants do their duty properly.

At a station where gas is used as the illuminating agent, there are also different conditions of service existing. Gas has to be made at the station, an operation requiring some special knowledge and additional labour.

With many of the lighthouses some sound producing apparatus is associated, which is intended to be made available when fog obscures the light, and here again in most cases the

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keepers have to be sufficiently acquainted with the machinery to be able to set the instrument in operation and to keep it going. Of these fog-signals we shall speak in another chapter, but we allude to them now in connection with the duties of a lighthouse keeper.

Taking the service as a whole, it would appear that the men are happy and generally contented, that the few inconveniences and risks connected with their vocation are balanced by advantages which are not to be found in more ordinary employments. A principal keeper gets about £72 a year, with uniform clothing, a comfortable house, fuel and lights, besides being supplied with all the necessary appliances and stores for cleaning, sweeping, &c. He has to insure his life at a cost of £3 a year, so that in the event of his death there is a small provision for his family, and when he himself is enfeebled by age so that active service becomes a burden to him, he can retire on a pension to spend the rest of his days in peace. An assistant-keeper's pay is, of course, not quite so high as a principal's, but the advantages in other respects are equal.

The following extract from the Regulations for the Lighthouse Service in this country will appropriately end this branch of the general subject, and will give a plain indication of the spirit by which the makers of the regulations are influenced in their supervision and directions of this most important service :—

"The keepers, both principal and assistant, are enjoined never to allow any interests, whether private or otherwise, to interfere with the discharge of their public duties ; the importance of which to the safety of navigation cannot be over-rated ; and they are cautioned that their retention or promotion in the service depends upon their strict obedience to orders, and upon their adherence to the rules laid down for their guidance ; on the exercise of constant habits of cleanliness and good order in their own persons and that of their families, as well as in every part of the lighthouse establishment and premises ; and they are warned that any breach of good conduct, temperance, or morality, or the use of bad language will render them liable to instant dismissal or other punishment ; or, on the part of any of their families, to their exclusion from the Corporations' premises."

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MERCANTILE MARINE OFFICES.

THE establishment of these offices dates from the 1st January, 1851. They were first termed "Shipping Offices;" and were brought into existence by the Mercantile Marine Act, of 1850. Their change of name was effected by the Merchant Shipping Act, 1862. The reason of their original formation may be traced, proximately, to the spread of "crimping." Remotely, no doubt, they were the natural growth of the extension of our Mercantile Marine generally. The complaining tone of the shipowning interest, caused the Government to make enquiry. It was found that, to protect herself, the great port of Liverpool had established a central office, with the object of facilitating the engagement and shipment of crews. This scheme worked so well, that with the consent of the shipowners, the system was extended in the United Kingdom: and, in order to ensure local influence and control, at each "great port" a Local Marine Board was established, with power to regulate the operations of such offices. Sixteen were at first formed, namely, London, Plymouth, Bristol, Liverpool, Newcastle, Shields, Sunderland, and Hull, in England; Aberdeen, Dundee, Leith, Glasgow, and Greenock, in Scotland; and Cork, Dublin, and Belfast, in Ireland. At Poplar the Sailors' Home had one—for the late Mr. Green's ships. At other ports the Custom Houses did the work. The latter were then considered "minor" ports, and were so classed in the annual account of the Mercantile Marine Fund. Since that date, however, some of those ports have shot ahead even of the "great ports" of the olden time. Notably Cardiff, which has now become the third office in the Kingdom for the extent of its operations—being only exceeded by those of Liverpool and Tower Hill, London. Poplar having lost its founder, whose memory is still "green" in that neighbourhood, was some years ago transformed from a "Sailors' Home" to a Board of Trade Office pure and simple, without any local control at all. The other ports which have grown up so as to be entitled to a Mercantile Marine staff

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separate from the Custom House, are Newport, Swansea, Avonmouth, Southampton, Victoria Docks, Gravesend, Grimsby, and Queenstown: Hartlepool will probably soon follow. But the most remarkable of all is Cardiff; and in order to show the extent to which the system has grown with the rise and prosperity of our shipping business, we have obtained some interesting figures from that port. In the first year of the establishment of shipping offices (1851) there were shipped and discharged at Cardiff, 2,531 seamen. In 1861, 7,942, or 213 per cent. increase upon 1851. In 1871 there were 18,657, or 135 per cent. more in ten years; and in 1881, 53,468, or 186 per cent. added in the decade. These are rather startling figures, and probably there is no counterpart for such rapid progress in the annals of any other port. At the same time it is certain that a number of other places have also made very considerable advance, for the development of our Mercantile Marine has been general and extensive throughout the kingdom.

As time proceeded other functions were added to these offices. The original idea was merely to engage and discharge officially those seamen who served in British ships voyaging in the trades outside the home trade limits, that is, between the Elbe and Brest, and including the home coasting trade. Also, to grant certificates of competency to masters and mates. In 1854, however, the great "charter" of merchant shipping was passed, and an extension of duties ensued. A money order plan and savings' bank for seamen were commenced in 1855 and 1856; and these involved much additional work. In 1862, the system of granting certificates of competency to engineers was brought into operation. In 1867, 1871, 1873, 1876, and 1880, important Acts were passed, all having a certain bearing upon these places of official business. In 1878, the Board of Trade, which department is the ultimate authority for the administration of the Merchant Shipping Acts, introduced what is called the transmission scheme, that is, for Board of Trade officers to ascertain on the arrival of vessels, if any of the crew desire to go straight to their homes. If so, they are furnished with a railway warrant, and a small advance of cash for cartage or for other

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necessary expenses, and their wages are remitted after them in a day or two. At Cardiff the seamen's money orders issued and paid were 57 in 1855. In 1881 they reached 9,119. In 1856 the number of transactions in the Seamen's Savings Bank was only one. Last year they were 813. In 1878 the number of men paid under the "Transmission" scheme was 98; and, in 1881, there were 865. In 1880—the first year when seamen were sent *from* the port under that plan—there were 424 "transmitted," and in 1881 the number rose to 1,395.

There is another phase of the question worthy of notice. About half way through the period since the introduction of the system, Cardiff had become sorely afflicted with the maritime disease which had called the shipping office into existence. In 1865, it is true, 13,290 seamen had been engaged and discharged in the office; but amidst these thousands the crimps had been very busy—so busy that even respectable shipmasters had been compelled to seek their aid, out of sheer self-defence, in order to obtain crews and get their vessels to sea. It is true that there was an office, but it was attached to the Custom House, and a trained and sufficient staff of officials had no existence. To cope with the evil the Board of Trade appointed a separate staff under their own immediate direction, with the Collector of Customs, as a link connecting them legally—for no statutory power existed till 1873 to form an entire separation. The Merchant Shipping Act—so far as the disciplinary clauses were concerned—had been, as it were, a dead letter. Instructions were then issued to put its powers into operation. Those, especially, of the 243rd section, Act 1854, against neglecting to join ship at sailing, and the 257th section for the suppression of crimping. This scheme commenced in October, 1866. No accurate statistics had been previously kept of the number of desertions; but it had been hazarded by a gentleman at the Chamber of Commerce that it amounted to 13 per cent. outwards. That is, of those seamen who failed to proceed in their ships after signing articles. A test was, however, made by a reference to the lists in the custody of the Registrar-General of seamen, of the crews who had signed during a short period in March, 1866; because it gave time for the vessels to return, and for thus discovering the exact state

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of affairs. It was found that out of 208 who had signed 40 failed to proceed, or at the rate of 19·23 per cent. At the end of the first quarter, 31st Dec., 1866, after the prosecutions had commenced, it was found that out of 2,874 signing, 112 neglected to go, or 3·89 per cent.; 9 were convicted and one was discharged by the Bench; in 1867, 14,030 signed, 399 "neglected" or 2·71 per cent; in 1879, 27,349 and 513 "neglected" or 1.87 per cent. That was the lowest figure attained; and it could hardly have gone much further down without being extinguished altogether. Such a consummation is only to be dreamed of. In 1880, the percentage of "neglecting" had sprung up to 2·80, for the "Payment of Wages and Rating" Act had then come into existence, whereby imprisonment for desertion was abolished. At the end of that year (1880) from the 1st October, 1866, no less than 277,951 seamen had been officially engaged at Cardiff; out of which number, 6,320 had "neglected" to go to sea, or at the rate of 2·27 per 100; 3,389 were ordered by the owners or consignees for prosecution; 704 were convicted, receiving an average term of imprisonment of 5¼ weeks; and 257 were set free by the Bench, who always inquired minutely into each case, and gave Jack the "benefit of the doubt," whenever possible. A proof of this is seen in the numbers discharged being as three to one of those convicted. The percentage of those convicted was 0·25 per cent., or one in 400 of those shipped. They were, we understand, generally the "rowdy" and drunken, whom in some cases the discipline of the prison has been the means of reforming. Last year, of course, as was the case all over the kingdom, no prosecutions of any moment took place. The operation of the Employers and Workmen Act, 1875, is so cumbrous that it is entirely unsuited to the swift career of modern shipping, especially for steamers. It acts against owner and seaman; the former has to get a three days' summons for desertion; and the latter the same for wages, before hearing. The effect of such a course must be obvious to those who areacquainted with the seafaring life of the present time. The ship cannot wait for the man; and the man cannot afford to wait for his money, so both "pocket the affront" as best they may. It is true that the Act gives power to seize the seaman-deserter and take him on board,

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but that is a kind of kidnapping not consonant with our habits; besides, the deserter may ask to go before a magistrate, and then he *may* be sent on board by the *posse comitatus;* and then, he may desert again, and so on *ad infinitum*. At Cardiff last year, 33,710 seamen shipped, and 1,948 "neglected to join," or at the rate of 5·75 per cent., a rise of more than double on the previous year.

The desertions from the vessels coming into port tell the same tale. The first figures we can procure are for 1873. In that year 13,692 men, crews of British vessels with agreements for foreign-going trade unexpired, arrived at Cardiff; 465 seamen deserted, or 3·39 per cent. In 1879 the numbers were 22,772; 183; 0·80 respectively. Since then, of course things have changed and prosecutions are dropped. Last year 24,860 was the number of seamen; 1,043 deserted, or 4·19 per 100. In 1873, there were convicted 32; and discharged by the Bench, 14. The average imprisonment was six weeks. In 1879, fifteen were convicted, with average imprisonment, one week, and two discharged.

The total prosecutions undertaken at this port since 1st October, 1866 to 31st December, 1881, were 1,808, out of which 961 were for "neglecting to join"; 210 for desertion; and 637 for crimping and other offences. The proceedings before the Justices seem to have been of the most impartial kind, and most of the penal clauses of the Merchant Shipping Acts appear to have been laid under contribution; all classes connected with shipping who have been bold enough to infringe the law have felt the same hard grip of the official hand. One class especially it is stated has felt the weight of this system most heavily; and that is the crimping fraternity, including the worst sort of boarding-house keepers and runners. In a few years about 150 either went off to sea or gave up housekeeping for other employments. Many are since dead, and a better class generally has taken the places of the old lot.

There is one interesting "return" which we have inspected, and which inspires us with bright hope for the future of our men. That is one about drunkenness. Some dozen years ago there was a great outcry about the drunkenness and "deterioration"—as it was called

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—of our seamen. In order to test the former, in February, 1871, the cases were counted at the pierhead of Cardiff and out of 1,094 who had shipped, 8 were found tipsy, and 30 "incapable"—leaving 96.52 per cent. sober men. In November, 1873, or nearly three years afterwards, by the same process, it was found that out of 2,001 there were 58 "tipsy" and only 3 "incapable"—leaving 96.95 per cent. sober men in the most practical of all senses. Up to the present time we are assured that the same feature of sobriety is observable in the majority—though it is said that at times when large crews are going on board long voyage ships, that some bad cases of drunkenness and disorder occur. To add to which the modern improved (?) system of paying "Jack's" bills on the capstan head as the vessel goes out does not improve matters.

Since the passing of the Act of 1880, a great number of vessels have been detained at sailing owing to the difficulty of getting the crews on board. There were 39 in 1880—August to December; and 141 in 1881. It is stated that not a single case can be traced as arising directly from that cause for fourteen or fifteen years. It is true that in 1867 a number of cases of detention in the "Roads" took place, but they were owing to crews refusing duty from alleged unseaworthiness, and analogous causes. This is the most gloomy feature of these interesting statistics which have been submitted to us; and we hope that before another year has rolled round, that an improvement will have taken place—although we see little prospect of it till another change of legislation shall have taken place.

MADRAS.—*Harbour Regulations.*—Owing to extensive breaches in the harbour piers, only three steamers can be accommodated inside the harbour at a time for the present, and therefore steamers will be admitted in rotation as they arrive. Steamers will be moored with two anchors, using their own ground tackling (no stern-fasts will be supplied as none is available) and they will be required to keep steam up in the event of an emergency arising requiring them to leave the harbour during the N.E. monsoon. *November*, 1881.

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SEA-ANCHORS.

EVER and anon after a succession of heavy gales such as occurred towards the close of the past year—bringing with them a long list of serious disasters to shipping, and great loss of life—we hear of the utility of the sea or floating anchor, and there is a general expression of surprise that such an instrument, so easily and readily extemporized, if a more efficient one be not on board, should not immediately have been requisitioned for the purpose of keeping the vessel head to sea, the more effectually to prevent her from wallowing in the trough of the sea to the imminent danger of a continuous sweeping of the decks, which not unfrequently ends in foundering.

We have reason to believe that the floating anchor was more generally used in the past than at the present time; not however because it was more necessary on account of the build and equipment of vessels in the past as compared with today, but probably because the "times were less pushing," and more thought was expended on the probabilities of a voyage which took almost as many months as it now does weeks to accomplish. Our present purpose is to describe some of the best kinds of floating anchors as used in bygone times, and also to indicate what may be done on the pressure of the moment, when, in a heavy sea during a strong gale, it becomes an absolute necessity to keep a vessel head to sea while repairing damage.

The late Admiral Smyth in the "Sailor's Word Book," briefly describes the *floating anchor* as "a simple machine consisting of a four-fold canvas stretched by two cross-bars of iron, rivetted in the centre, and swifted at the ends. It is made to hang perpendicularly at some distance below the surface, where it presents great resistance to being dragged through the water, diminishing a ship's leeward drift in a gale where there is no anchorage." Similarly, the late Captain Alston in his "Seamanship," under the head of "*danger of foundering*," says:—"Rig a sea-anchor with three

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spars in the shape of a triangle, and lash a sail across it; at one corner sling a weight proportionate to the size of the spars; launch it overboard, and ride by it; if unable to do this, letting go an anchor and veering a long scope (if possible of hemp cable) will in some measure steady the ship by bringing her head towards the sea."

Both descriptions are brief; and indicate the use of a sea or floating anchor rather than the making of such an one that may be permanently efficient. For this we must go to an earlier date. In the first edition of Falconer's "Universal Dictionary of the Marine," published in 1769, there is no mention of any kind of sea anchor; but in a later edition of the work, edited by Dr. W. Burney in 1815, the *floating anchor* is described as "a simple implement which is sunk below the swell of the sea, where there is no other anchorage, for the purpose of preventing a vessel from drifting. Dr. Franklin proposes that it should consist of a wooden cross, from the ends of which a sail should be stretched, covering the cross, and even all the extremities. It has also been used in the figure of an umbrella." The doctor then proceeds to describe the anchor, and give a figure of it, but both are unacknowledged copies from Gower.

Richard Hall Gower was a Seaman of repute in his day, and Chief Officer in the Honourable East India Company's Maritime Service; and it may be worthy of remark that in a supplement to his "Seamanship," he described a patent log of his invention, not wholly dissimilar from many of the instruments patented and used in the present day.

A floating anchor was first figured and described in Gower's "Treatise on the Theory and Practice of Seamanship," which passed through three editions, the last edition being published in 1808. It is now out of print, and scarce, but as the late Sir William Mackenzie (an Officer in the Peninsular and Oriental Company's service) observed, "old-fashioned as the work may appear in these days of steam, there is much of value in it for the officers of the fine sailing fleets of the present day."

According to Gower, "the floating anchor to ride a vessel in a

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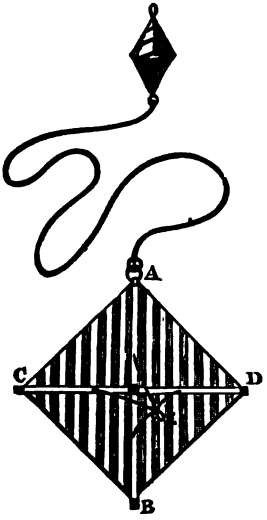
gale of wind," was first devised by the fishermen in the North Sea, who, after they were driven from their anchors, made use of what they termed a drogue-sail to ride their vessels by; but this idea was improved by Dr. Franklin, who recommended a floating anchor for that purpose, much in the shape of a kite, which is made to dive beneath the heave of the sea, and is shown in the following diagram:—

Construction of a Floating Anchor.



"This figure shows two cross pieces of iron, in length nearly half the beam of the vessel the anchor is intended for, and united by a bolt through their centres, that they may be swung together when the anchor is not wanted. At the end of the cross pieces are holes for the rope A D B C to pass through, which must be hove extremely taut. To this frame is fitted a strong double canvas cloth of the same shape, which is laced taut out to the rope. At the centre of the frame E is a crow-foot of four legs, coming from the cross pieces on each side of the centre, which meet in a loop below the centre, towards B, so that when the crow-foot is pulled upon, the anchor may incline to the water and

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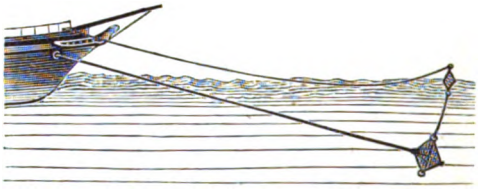
dive down, the same as a kite rises in the air. At A is a ring, to which is bent the end of about 12 fathoms of rope, with a buoy at the other end, to prevent the anchor from diving lower than the length of the rope. When this anchor is to be used, let a hawser be bent to the crow-foot, and a small rope to the buoy; then put the anchor overboard, and veer away upon the rope and hawser to a sufficient quantity to ride the vessel, when it will have the appearance of the figure in the following diagram :—



"To get the anchor on board again, haul upon the small rope, which will cause it to come flat to the surface of the water, in which position it may be easily drawn to the vessel. It will be necessary to have the mizenstaysail in readiness to hoist, to keep the ship to the wind till the anchor is hauled on board and placed away."

About 50 years ago the late Captain J. A. Turner adopted a sea anchor of a more elaborate make; it was greatly prized at the time and was in very general use. The description given of it by his son was as follows :—

"It is formed of four parts of tarpauling canvas, about six or seven feet square, A, A′, A″, A‴; each two parts are stitched together, having eyelet holes at the corners and centre; they are then placed together, and a space is sewed from corner to corner about six inches broad; the whole four parts are then roped round the edge with 2½ or 3-inch rope, having cut splices at the corners through which two bars of iron having corresponding holes in them are rove; through these holes screw eyebolts are placed, and nuts fasten them on the opposite side; from these eyebolts chains are shackled to form a span to a large ring, to which the hawser is bent on, by which the vessel rides, and the apparatus is

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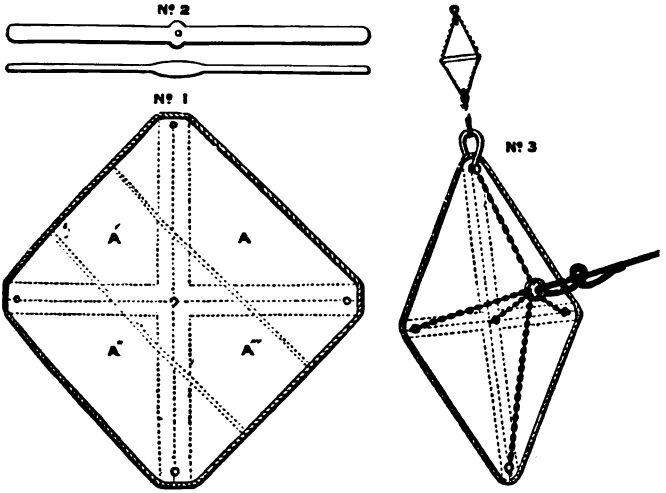
floated with a nun-buoy and rope to the depth of about 10 fathoms* :—



"In the vessel that I served the first part of my apprenticeship we had the apparatus on board, and, having seen it used, can speak confidently of its utility; and as it takes but little room when it is unrigged and rolled up, one of the great objections to having (so-called) useless lumber on board ships is obviated, as it can be stowed on battens between two beams on the main-deck, handy for use."

The prototype of this is, undoubtedly, Gower's floating anchor, respecting which Sir William Mackenzie wrote :—"Every seaman will see how preferable is this way of riding out a gale to the old plan of 'heaving-to,' while, added to ease and security, there is infinitely less drift."

Excellent as these floating anchors undoubtedly are, it is essential that the material for their quick construction should be on board ready at hand for use when required.

But it is on record that a disabled ship has, where no such appliance as the sea anchor was at hand, ridden out a gale, and refitted after the gale had subsided. Admiral C. Ekins, in his

* No. 1. Form of the apparatus unrigged. No. 2. Shape of the iron bars. No. 3. The apparatus when in use.

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work on "Naval Battles," published in 1824, gives the following instance of even a cable serving the purpose:—

"When Admiral Sir Israel Pellew was captain of the *Cleopatra*, of 32 guns, upon the coast of North America in 1797, in the month of September, he was overtaken by a hurricane about 500 miles from the Island of Bermuda, and the mainmast, which was before defective, being carried over the side about 10 feet above the quarter-deck with the increasing force of the gale was soon after followed by the foremast, mizenmast, and bowsprit, leaving the ship entirely at the mercy of the waves.

"In this situation, when, from the heavy and deep rolling of the ship, no person could keep his feet, it was proposed to the captain to ease the ship by throwing the guns overboard, but this he resolutely forbade; but he at the same time resolved to have recourse to an expedient, which was only known to him by tradition. He directed the cable of the best bower anchor to be cut at the clinch, and then payed out into the sea until a sufficient scope had been given to cause the ship to ride easy to the sea. When 70 fathoms of cable had been payed out, the ship rose to the sea in such a manner that her forecastle was dry and the men could stand to their duty, and they then soon got rid of the masts and rigging.

"In this manner the *Cleopatra* rode for three days and drifted about 40 miles. The gale abated; they raised the jurymasts from their spare topmasts, &c., and having completed the equipment of the ship, they hove in the cable and made sail for Halifax.

"Few seamen, says Admiral Ekins, have formed a right estimation of the value of anchors and cables in situations like this. It requires a well-authenticated fact to fix the circumstance strongly in the mind, and I had this account from Sir Israel Pellew himself."

We reprint from the pages of one of our back numbers a communication on the subject of sea anchors from one of our correspondents. He says:—"I have noticed with pleasure that in the examination for masters and mates they are required to know how to rig a sea anchor. I think more than that is required. All steamships should be compelled to carry one ready for use. It is

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not a difficult thing to rig if you have spare spars, but there is not one steamer out of twenty that has. Also, when a sea anchor is wanted in a heavy gale, it is not a nice time for rigging one. In my opinion the great cause of loss and damage to screw steamers is that you cannot heave them to with the engines stopped. You are obliged to keep steerage way on them, which forces them against the sea, adding greatly to the risk of taking in heavy water. Many long, lean ships do best head on to the sea, and it requires very great attention both to speed and steerage to keep so with safety. A great many ships break down. A friend of mine broke his shaft in a heavy S.W. gale, and came very near to foundering; he could not keep his ship to. With great difficulty, from the sea breaking on board, he got out the best sea anchor he had the means of rigging out, but it was not enough; as a last resource he paid out sixty fathoms of cable, and the ship rode out the gale well. He considered that he had thus saved the ship and all on board."

All being agreed as to the value of the sea anchor, we hope to hear of its general adoption. On an emergency a ship has been known to ride by heavy spars thrown out on the spur of the moment; but these, in the case of a large vessel, are comparatively ineffective. Spars drift much faster than a sea anchor, which from its make and position in the water, being well under the trough of the sea, offers great resistance to the drift of the vessel. We hope shortly to be furnished with particulars of a good sea anchor that can be extemporised from materials always lying ready on the deck. This is the thing wanted.

METEOROLOGY.

THE following useful and accurate summary of the present state of the science of meteorology has recently been given by Dr. Grant, Professor of Astronomy in the University of Glasgow.

"A person wrote to Sir William Herschel requesting to be informed respecting the state of the weather during the

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next few months which would elapse after the date of his letter. The illustrious astronomer replied in terms to this effect: — 'The question of predicting the weather is one which is above the comprehension of astronomers and men of science in general.' This letter was written about 100 years ago, and it expressed very concisely the immense difficulty of the problem. In those days the observations of the weather were very imperfect and limited in range. But a more hopeful view presents itself in the present day. During the last thirty or forty years systematic observations of meteorological phenomena have been carefully made in all the countries of the civilised world. In many instances those observations have been discussed by men of science, and conclusions have been deduced from them which have thrown much interesting light on the climate of the countries to which they refer. Furthermore, the invention of the electric telegraph has supplied the means of rapidly confronting distant observations with each other, and of disseminating with equal rapidity the conclusions deduced from this inter-comparison. The result, then, is that in the present day the science of meteorology includes many valuable conclusions arrived at by careful induction from observation, and that even in the matter of predicting the weather some progress has been made. It is, however, to be borne in mind that the attainment of this last-mentioned object is due rather to a sagacious interpretation of the observations, combined with the marvellous aid of the electric telegraph, than to a rigorous deduction from established scientific principles. In systematic observations of meteorological phenomena the Royal Observatory, Greenwich, led the way in this country. Subsequently the observatories of Oxford, Liverpool, and Glasgow devoted attention to the same object. The establishment of meteorological societies in England and Scotland about the same time contributed also to the advancement of meteorology as a science. The Meteorological Office, originally a branch of the Board of Trade, commenced its labours in 1868, the Council of scientific men under whose direction it is conducted being nominated by the Royal Society. Now, there are three leading objects which the Council have unde-

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viatingly kept in view since the commencement of the existing organization in January, 1868. These are:—1. Ocean meteorology. 2. Land meteorology of the British Isles. 3. Weather telegraphy. Allow me to make one or two remarks on each of those objects. I need not dwell upon the vast importance of ocean meteorology. It is upon the information furnished by this branch of the science that our ships, whether of the Royal or the Mercantile Marine, must rely for shaping their courses most advantageously over the trackless ocean. A fine field of scientific work is here opened up to ship captains who have a taste for the observation of meteorological phenomena. Any of such officers who desire to co-operate in taking observations is furnished with instruments for the purpose, and it is gratifying to learn from the annual reports of the Meteorological Council that the labours of many of them in this respect are much appreciated by the Council, as constituting valuable materials for subsequent discussion. Seven observatories have been established in connection with the Meteorological Office with a view to the advancement of the land meteorology of the British Isles. These are the observatories of Valentia and Armagh, in Ireland; Falmouth, Kew, and Stonyhurst, in England; and, finally, Glasgow and Aberdeen, in Scotland. The observations at each of these observatories are all obtained by means of self-recording instruments, and the tabulated results are regularly transmitted once a week to the Meteorological Office in London. The variations of the barometer and of the dry and wet bulb thermometers are recorded continuously upon paper by a photographic process which goes on night and day without intermission. The velocity of the wind is measured by its action upon a system of revolving hemispherical cups—an instrument invented by Dr. Robinson, the director of the Armagh Observatory. I was lately induced to make some calculations based upon the recorded anemometer observations at the seven observatories, with the view of ascertaining the mean hourly velocity of the wind at each observatory during the years 1874-5-6. The results of my calculations were these:—The mean hourly velocity of the wind for the three years in question was—for Armagh, 10·6 miles, 10·0 miles, and 9·8 miles; for Kew, 10·3 miles, 10·8 miles, and 10·8

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miles; for Stonyhurst, 10·8 miles, 10·9 miles, and 10·7 miles; for Glasgow, 12·9 miles, 12·1 miles, and 12·4 miles; for Aberdeen, 13·3 miles, 13·5 miles, and 14·2 miles; for Falmouth, 16·8 miles, 17·0 miles, and 17·4 miles; finally, for Valentia, 18·2 miles, 17·7 miles, and 17·9 miles. It will be seen from this how nearly the annual mean results obtained at the same observatory agree with each other. It will be seen further that, while Armagh, Kew, and Stonyhurst have the least wind, the lion's share of the wind falls to Valentia and Falmouth; while, again, the Scottish observatories hold an intermediate position in this respect. These results, it must be admitted, speak well for the observations on which they are based, and for the instruments with which the observations are made. They also afford us an interesting illustration of the presence of law as the regulator and controller of all the phenomena of Nature. "Variable and fleeting as the wind" is an expression often used, and yet, when the winds at any place, which blow from all points of the compass, are gathered together, their aggregate velocity from year to year is found to be almost identical in amount. It cannot be doubted that important conclusions tending to throw light on the climate of the British Isles will result from a discussion of the observations received at the Meteorological Office from the outlying observatories. I have, finally, to make a brief reference to weather telegraphy. In considering this matter, the important fact must not be lost sight of that the forecasts of the weather which emanate daily from the Meteorological Office are not given forth as rigourously deduced scientific conclusions by the eminent men of science who constitute the Meteorological Council. Had they been less fettered in the matter, they would probably have been more cautious, but they have wisely yielded to the public demand for such forecasts, and it must be admitted that in this instance the public instinct was in the right direction. The success of the forecasts, considering the difficulties which meteorologists in the British Isles engaged in such an inquiry have to contend with, has been very decided. During the last two or three years as many as 75 per cent. of the storm warnings which have emanated from the Meteorological Office have been thoroughly successful. We may

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therefore confidently indulge the expectation that, with the progress of further researches, the percentage of successes will continue to increase. The Americans have shown great enterprise and skill in this matter. But it is to be borne in mind that they have an advantage in the inquiry which we cannot, from the nature of things, possess. For storms that come from the west—and these are the storms which really strike our shores—the Americans have a whole continent at their backs upon which to plant signals for the purpose of informing them respecting a coming storm; while we, on the other hand, have only the Atlantic, where no signals can be established. The present winter will hereafter be memorable for its storms. I may state that, in addition to Robinson's anemometer for measuring the velocity of the wind, an instrument which belongs to the Meteorological Office, we have also an anemometer by Osler for the direct measurement of wind pressure, which is the property of the observatory. During the storm of Friday, the 6th inst., this instrument recorded a pressure of 51lb. on the square foot, and yet it bore the strain throughout admirably. I may remark in this connection, as an interesting fact, that during the great snowstorm which swept over London and its neighbourhood on the 18th of January, 1881, the Osler anemometer at the Royal Observatory, Greenwich, registered as high as 51lb. on the square foot. The tremendous storms which occasionally sweep over a country are, no doubt, originally due to the agency of solar heat disturbing the equilibrium of the atmosphere; and, no doubt, the day will come when a close physical connection will be established between those grand phenomena and the origin of nearly all the energy on the earth's surface. But it may be a long time before this conclusion is arrived at. One of the most serious difficulties which meteorologists have to contend with consists in the imperfect knowledge which exists respecting the climatic conditions of the upper regions of the atmosphere. Mr. Glaisher, by his aeronautic ascents, did good service in this matter; but still much remains to be done, and it is probable that balloon ascents, notwithstanding the danger of such enterprises, of which we have had recently a sad illustration, will continue to constitute

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the only practicable means for arriving at materials which will serve to throw light upon this important question. In connection with this circumstance I should not omit referring to the series of meteorological observations conducted during last autumn on the summit of Ben Nevis, under the auspices of the Scottish Meteorological Society. This spirited enterprise deserves to be renewed, and it appears to me to be one of those to which the Government might wisely give some support in conjunction with gentlemen of scientific proclivities throughout the country. I would finally remark on the desirability of establishing meteorological observatories on the east coasts of England and Scotland. It is noteworthy that from Dover to the Orkney Isles there does not exist upon the coast a single meteorological observatory, except the one established at Aberdeen in connection with the Meteorological Office. This is a state of things which ought not to exist, and the want of such an institution was felt at the time of the Tay Bridge accident. Liverpool has set a noble example to other seaports in this respect, which is worthy of being imitated by the important seaports in the North of England, and by the ports of Leith and Dundee, in Scotland."

COAST DEFENCES.

DOUBTLESS many an officer of the old school, and possibly a few of the new also have pronounced much of what has been published under the above heading fallacious. It is no use attempting to convince such men that science is entering into the humblest of employments; they hope, if they do not believe, that things will last their time, and do not wish to be ousted from the well-worn groove of old fashioned ideas. A few years since the sailing lights of Her Majesty's ships were notoriously inferior to those of the great steam lines, so much so indeed that it was a standing order with many commanders to inspect and report on their condition every hour. Many an old quartermaster has eased his mind by letting out at the yellow sickly flame and charred

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wick of the old fish globes. "It ain't a no use a calling out quarter-master, they won't light up do what you will, the ile won't rise. I see 'em scalded out this blessed morning I did." At some expense and no inconsiderable amount of trouble, the writer essayed to alter this, but the captain of the ship on board of which the new pattern lamps were tried, said the old would do for him and the experiment fell through. Since that time the subject has been gone into by the Admiralty, and new pattern lamps introduced. In coast defences it was alleged that if the Royal Naval Reserve were required at a short notice, some would be found on the sheep farms of Australia, some in the backwoods of Canada and some in Franz Josephs Land. By a singular coincidence it has been ascertained that the following Naval Reserve men are with the adventurous Mr. Leigh Smith in the *Eira;* their name are: Adam Gray, James Mackmillan, George Alexander, Robert Crooks, William Masson, Andrew Valentine, John Harvey, Charles Marshall, and Thomas Fenton; and under no circumstances can they reach this country until next summer, if so early. It is not judicious to put confidence in a force which is straggling in every quarter of the globe, even if the individual members are desirous of loyally carrying out their engagement.

Another fact, which was alluded to, has cropped up most disagreeably in the discreditable outbreak on board the *Duke of Wellington*, indicating that the training of boys must be carefully watched, or more discreditable scenes will follow. An obedient crew is doubly strong from the fact that they all work in harmony with their officers and with one another. A mutinous ship was never a smart one. Those who are interested must decide, after what has occurred, if the remarks on the impropriety of ladies residing on shipboard were just or unjust.

But the most important comment on "Coast defences," is contained in the remarks of Sir W. Armstrong in his speech at the Institute of Civil Engineers. Especially do they bear on the artillery and construction of the much vaunted *Comus* and *Gem* class. The former were heralded into the world as the type of what cruisers should be—swift under steam and sail, and formidable in action. Alas! that they should be otherwise; but comparatively small guns,

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a lumbered deck, and huge masts, render them little better than an old class of corvette dressed out with modern trappings. Three powerful breech-loaders would in these days of precision be worth their whole battery; indeed, in smooth water, a swift gun-boat with a single long-ranged gun would be a troublesome opponent. This subject has been so well ventilated and thoroughly threshed out, that to dilate further on it would be riding an idea to death.

The writer feels confident that as time goes on, it will surely bear out the correctness of what he has stated, and with such a conviction in his mind he bids adieu for ever to naval subjects. Change is the order of the day; so rapidly do they take place that he who would make himself familiar with them must ceaselessly watch their development in order to detect what portion will be of real service to his country. Let us hope that the "lasting my time" principle is dead and buried, and that the rising generation will retain the empire which their ancestors have built up with so much blood and treasure. W.

NOTES FROM CONSULAR REPORTS.

BREST.

The principal port of Brittany, from which agricultural produce and sardines are the most important exports, and to which wheat, timber, coal, hemp, &c., are sent from different countries. There are also several smaller ports in the same department (Finisterre), whose articles of export and import appear to be similar to those of Brest. British shipping is fairly represented, both in number and tonnage. There is nothing specially noticeable in regard to the trade.

The Consul alludes to the frequent casualties to British shipping on the coast, which he considers to be due to shipmasters hugging the coast too closely, and during the fogs which are of sudden and frequent occurrence, going ashore. He also asserts that the lead is neglected on a coast where soundings are of the utmost importanee.

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SAIGON, COCHIN CHINA.

British shipping preponderates largely at this French port. Piece goods, coals, wines and spirits, flour, and petroleum, are the chief imports; rice, silk, hides and horns, cardamons the principal exports. Some improvements are much required in the port arrangements, and the Consul says changes are about to be made. The new bounty system may possibly have the effect of increasing the number of French ships visiting this port.

KONIGSBERG.

The trade of this port appears to be forsaking it for the neighbouring Russian port of Libau. There seems to be a want of depth of water between Königsberg and its outport, Pillau, which with the Russian railway tariffs, the import duty and some new Custom House rules, operate disadvantageously against the trade of the place. The grain shipments alone from this port have steadily decreased for many years, while those from Libau have correspondingly increased. General cargoes, coals, cement, petroleum, bricks, were the chief imports in the year; grain of all kinds, hemp, flax, rags, and spirits, were the exports. British vessels have a large share of the carrying trade.

DAR-AL-BAIDA, MOROCCO.

A decided improvement in the trade of this port is chronicled. Better crops and high prices have stimulated the export of grain, beans, lentils, maize and peas. The import trade is reported as having been very satisfactory, especially from England. British shipping is also predominant at this port.

MAZAGAN.

A large increase in exports, and a small decrease in imports are recorded; the former consisting of grain, beans, peas, wool, almonds; the latter chiefly of cotton goods. British shipping largely preponderates.

MOGADOR.

Imports:—Cotton goods, iron, petroleum, sugar, rice, &c.

Exports:—Grain, almonds, esparto grass, ostrich feathers, hides, gums, &c.

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The district is evidently an improving one, with undeveloped possibilities. Climate mild and equable. Public health good. Great Britain does the largest trade with the district both import and export, but it seems as though it might be extended.

RABAT.

A stand-still place with just enough trade to keep going. Much dependent on harvests. Splendidly situated for shipping purposes, but crippled by action of Moorish government.

SAFFI.

Trade very dull. Prospects gloomy.

TANGIER.

Falling off reported in exports and imports, the former consisting of dates, beeswax, oxen, hides, eggs, goat skins, slippers, woollen stuffs, &c.; the latter of British cotton goods, cloth, loaf sugar, raw silk, tea, &c. A slight increase in shipping is reported, especially under the British flag.

NICOLAIEFF.

American competition in cereals (the staple export), and the failure of the 1880 harvest have caused a great depression, but the evil does not appear to be necessarily permanent. Imports show an improving tendency. Machinery nearly doubled in 1880. English coal figures in the imports, but it is to be feared that it cannot compete with local coal, although the quality of the latter is said to be inferior. The custom duties have been raised 10 per cent., it was thought for the purpose of protecting native productions. But the abolition of the Salt Tax whereby the trade in that commodity has been thrown open to all comers, the Imperial Exchequer being thereby a great loser, hardly bears out the protective theory. The shipping trade of this port is almost entirely monopolised by British vessels. Freights are reported to have been unremunerative in 1880.

Moorsom's International System of Tonnage Admeasurement was to have come into operation at the beginning of last year, and improvements are spoken of with the view of facilitating vessels coming up and loading or discharging at the port.

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CORRESPONDENCE.

SIGNALLING AT NIGHT TIME.

To the Editor of the "Nautical Magazine."

SIR,—For some years passed I have noticed how sadly deficient our signalling is in the Merchant Service by day and night. We still make use of the flags by day, which is well at a long distance, but at night the only way of communicating is by running up alongside of a ship and hailing, or sending a boat. The first course is objectionable being liable to a collision, the second owing to a heavy sea is often impracticable, whereas in men-of-war the semaphore is used by day, and flash signals by night, all messages being transmitted with great accuracy and rapidity. In telegraph ships the flash light on Morse's system is also used to great advantage. I am glad to think there is now a chance of improvement in this important matter, for the *Worcester* and *Warspite* Committees have determined to have the systems taught, and no doubt the other training ships will take it up. By this means we shall infuse a fair number of officers and men who are good signal men into the Merchant Service. I may also mention that the Trinity House have a signal station from the Farne Islands to North Sunderland, working well on the Morse system, and they are introducing the same on board all lightships. I feel sure that all captains and officers of ships will agree with me that little information is to be got out of passing vessels, particularly in these days of great speed. At times it is quite a scramble to bend the flags on, some are hoisted wrong, some upside down, and others full of turns, and such remarks as these are made:—"Look sharp there, bend on," or "Your fingers are all thumbs," or "Come out of that, let me bend on," and then signal halliards are let go, necessitating a man to go aloft—and bring the end down. The consequence is that the ship passes and no result.

I will state a case that happened to a mail steamer broken down; a man-of-war was sent to her assistance, the sea was high and communication was difficult. Fortunately she had a young naval officer on board as passenger, who understood the semaphore; he

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volunteered his services and communication became perfect. My reason for advocating the Morse system is that it is better adapted to our Commercial Code and will become universal. It is used in the Army by day and night and with the heliograph; besides which, it teaches telegraphy, and is to be adopted in the Navy.

The semaphore can be made by any ship's carpenter, and the lamps can be procured of Messrs. Ridsdale, Minories, at a small expense.

I am informed that Lloyd's are about to place signal stations all round our coasts, to signal the names of vessels passing in the day-time, but if flashing signals were adopted in our Mercantile Marine, communications might be made at night-time as well.

I enclose the symbols of both systems, which may be useful.

I am, Sir, your obedient Servant,

London, January 26, 1882. WILLIAM WOOLCOTT.

HEALTH OF SEAMEN.

To the Editor of the "Nautical Magazine."

Sir,—Whilst acting as a surgeon in the Mercantile Marine, I have often been struck by the number of unhealthy and unfit hands shipped for voyages where none but the most vigorous are required. This to a certain extent is obviated by the examination (made by the surgeon prior to signing on) required by most of our large companies; but still, where you have no record of a man's prior health, and where to all appearances he is robust, you cannot with any certainty judge as to whether he is one who will figure on the "sick list" or not. I would suggest a simple means of removing this fertile source of annoyance to all hands. If, in addition to the existing two circles on the back of a discharge, another were added with some such words as "days off duty from illness" and "disease" to be filled in by the purser from the Official Log Book, a man's discharges would thus represent a journal of his health from voyage to voyage, and any capable person could at once pick out and select an able-bodied and fit set of men as required.

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Commending this suggestion to the consideration of the readers of your paper.—I am, yours truly,

ARTHUR H. WOOD,
Late Surgeon, Royal Mail S. P. Company.

53a, Well Street, Oxford Street, W., January 20, 1882.

INSURANCE OF SEAMEN'S LIVES.

To the Editor of the "Nautical Magazine."

SIR,—I was pleased to read in your valuable Magazine for this month a letter under the above heading. I hope the idea will be advocated by you; for, if so, it may have some chance of being fostered, and ultimately adopted. I have long thought of the plan, and, in 1874, when the Unseaworthy Ships' Royal Commission was sitting, I proposed such another scheme to the authorities. I believe it has also been advocated by one of the Northern Chambers of Commerce, if I mistake not. My proposal was simply to adopt the Post Office Annuity and Assurance principle; of course, founded upon an Actuary's estimate as to premiums for increased risk.

I think such a scheme would ultimately be popular. It could easily be worked at the Mercantile Marine offices, where the Seamens' Savings' Bank and money order system has proved a success. It is more in keeping with the spirit of the age than the old pension system. Masters, mates, and engineers should be admitted to its benefits, I do not, however, agree with Mr. Thubron in asking the owners to contribute. That would be an element of weakness. The scheme should rest upon its own basis, and the rates be sufficient to make it a "paying concern" if honestly worked, as no doubt it would be under such a body as the Board of Trade. I would, however, appeal to the Government to give what aid can be spared from the vote for merchant seamen out of the Greenwich Sixpence Fund, the Merchant Seamen's Fund, and the fund accumulating year by year out of the sale of unclaimed effects and wages of deceased merchant sailors. This boon might honestly be claimed for such a purpose —not, however, to ruin the scheme by fictitious or extraneous propping—but in order that bonuses should be added to the capital

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sum. A similar fund has been so worked by the Customs' Officers for many years. It was supplemented out of the Bill of Entry Office Rates, and from a poundage (now ceased) being levied upon the officers' salaries. I am &c.,

Cardiff, January 3, 1882. W. T.

COAL SHIPMENTS IN THE UNITED KINGDOM.

To the Editor of the "Nautical Magazine."

SIR,—For the information of your readers I give below particulars of the coal and coke shipments in Great Britain abstracted from "Browne's Export List" for the years 1880 and 1881. You will notice that the Tyne ports still hold the first rank; Cardiff second; Sunderland third; Newport fourth; Swansea fifth; the Hartlepools sixth; and Liverpool seventh.—I am, &c.,

ROBERT THUBRON.

Port Charges Office, Newcastle-on-Tyne, January 16th, 1882.

Ports.	1880. Tons.	1881. Tons.	Tons. Increase. 1881.	Tons. Decrease. 1881.
Alloa	145,819	121,426	—	24,398
Amble	178,531	186,423	7,892	—
Ardrossan	227,713	208,729	—	18,984
Ayr	312,885	345,053	32,168	—
Blyth	232,417	178,294	—	54,123
Bo'ness, including Charlestown, Inverkeithing, and St. Davids	327,255	324,101	—	3,154
Cardiff	5,905,111	6,568,895	663,784	—
Dundee	62,882	69,226	6,344	—
Glasgow	239,472	299,351	59,879	—
Goole	385,780	384,052	—	1,728
Grangemouth	115,750	99,954	—	15,796
Granton	139,130	232,019	92,889	—
Greenock	111,123	120,788	9,665	—
Grimsby	375,040	321,370	—	53,670
Hartlepools	1,129,881	1,165,944	36,063	—
Hull	617,477	627,023	9,546	—
Irvine	97,117	89,401	—	7,716
Llanelly	197,739	170,400	—	27,330
Liverpool	1,076,816	1,157,597	80,781	—
Newport	1,908,151	2,063,271	155,120	—
Port Glasgow	8,349	8,630	281	—
Seaham	593,274	502,374	—	90,900
Sunderland	3,356,305	3,449,313	93,008	—
Swansea	1,616,524	1,676,606	60,082	—
Tees Ports	109,013	86,268	—	22,745
Troon	332,199	380,363	48,164	—
Tyne Ports	8,131,419	8,194,578	63,159	—
Whitehaven	198,838	214,644	15,806	—

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WATCH AND WATCH.

To the Editor of the "Nautical Magazine."

SIR,—Having some not inconsiderable experience as surgeon on board different steamers and in different climates, I beg to offer a few observations on that passage of an article in your current number entitled, "A Few Remarks on the Navigation of Passenger Ships," which recommends the system of three watches of officers (and I should hope of men too), instead of two in the North American lines. I can only say from the outset that I most warmly recommend this proposal for a general introduction of the three watches system which obtains in the Indian, Australian, Cape, and Brazil, as well as the West Coast, and I think also the West India steamers under the British flag. I must confess that I have always wondered how it happened that the steamers of the North American lines, which go at a greater rate of speed through a more stormy ocean, in fogs, hurricanes, past icebergs, and on a most crowded route, carry only the same complement of officers (or even less, as many P. and O. steamers for instance, actually have five officers), as the passenger ships in the more tranquil seas. The toil and stress of constitution to which the four officers of the American mail steamers are subjected on the two watches system, especially during the winter months, seem to me not only prejudicial to the men's health but also to the safety of the ships and the interests of the owners themselves, and increasingly so, as competition between the different lines goes on, in the nature of things, more severely than ever. In your journal it has previously been pointed out, how the watch and watch system, which gives an officer only four hours' rest at a stretch during the whole run across the Atlantic, disposes greatly to fatigue of his eyes, diminished perception of the retina, and a diminished colour sense. From the complaints I have heard and the occasional tests I have made, I must confirm this, and I believe it will be corroborated by the experience of many ships' doctors. There are other evils created by over-exertion of the physical powers. The violent motion of the ship, much more trying on the bridge, requires a constant straining of muscles which leads to an irritability of the nervous system, either blunting or im-

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pairing the full mental powers of a man. It often prevents him from enjoying a healthy sleep, and it tempts him either to seek a false relaxation by smoking in bed or trying to induce sleep by the whisky-bottle. Many of the small cabins in which the third and fourth officers are lodged together, have deficient means of ventilation, or in cold weather, they are not used, from want of attention on the part of the fatigued and drowsy men. In an atmosphere, pregnant with tobacco fumes and other vapours, the officer passes his short period of rest and then rushes out again into the fierce blast of an Atlantic gale or an icy snowstorm, whilst his blood is still overcharged with carbonic acid and volatile poison. This may go on for days and nights during a week or longer, as everyone knows who has made winter voyages across the Atlantic. The strongest become predisposed to bronchitis, pneumonia—especially those with a taint of tuberculosis, and in some ships to diptheria or tonsillitis of a milder type. Even without the severer complaints actually becoming established, we often see at the end of such a voyage all the officers, from the captain downwards, with bloodshot eyes, swollen faces, coughing and talking in whispers, or in a hoarse voice. Year after year of such fatigue must tell, and it brings on asthmatical attacks and organic heart and arterial disease. Much, of course, must always happen as the consequence of every sailor's exposure in such a climate and such a trade, but it would materially decrease if the three watches system allowed rests of seven hours, gave the officer a little more variation from the terrible monotony and excessive responsibility on the bridge, and allowed him to pay proper attention to the hygienic conditions under which he lives. Men with old sores, serious chronic complaints, ruptures, severe dyspepsia, incipient consumption, are sometimes found under the two watches system in North Atlantic steamers, who ought to have no business at all on active service, or at least not in this trying branch of it. I feel sure that once the practical sense of British shipowners—always keen where their interests are concerned—is clearly directed to an alteration of the present system, they will test the matter thoroughly, and in the end will not only adopt the three watches, but provide

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six officers for them in every large steamer. They might train two of them to act as purser and supercargo, which would do away with that often pompous but overestimated clerkship, and raise the self-esteem of the former, who know that the "purser" is generally the "confidant" of the "office people." Such a more liberal system ought then to be completed by allowing every zealous officer during the year one month's furlough on full pay, either for his bodily recreation, if he wants it, or for his professional advancement by way of attending lectures, visiting museums and exhibitions, or factories and building yards. This is not in my province, but I cannot help thinking that the man, not only the sailor, would be improved and invigorated by such a new stimulus above the old ways of routine.

Steam has removed many of those barriers which made practical seamanship almost an exclusive privilege of the inhabitants of these isles, and without undervaluing its importance, it might be said that it can now be more easily acquired by novices if they are physically strong, and of that mental strength which is derived from a general education. For the latter, the young officer not only wants the opportunity, but also the time and the stamina. The watch and watch system, I believe, is injurious to him in both respects.

I remain, Sir, yours faithfully,

AMERICANUS.

THIRD CERTIFICATED OFFICER.

To the Editor of the "Nautical Magazine."

Dear Sir,—I fully agree with *most* of the remarks contained in the paper on the Navigation of Passenger Steamers which appears in your issue for this month; but the writer, in treating on the three watch system, forgets that at present a third officer, though he may be a "passed" master, does not appear on the ship's articles as a certificated officer, and no ship is bound by law to carry more than two responsible and certificated mates. If the Board of Trade would but acknowledge the necessity of three officers in our large passenger steamers, and oblige any steamer

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beyond a certain tonnage and carrying over a certain number of passengers, to carry a third officer properly qualified, the matter would be settled in the best possible way, and the position of that third officer properly recognized without putting any extra responsibility upon the masters of such ships, who have enough already in my humble opinion.

I am, Sir, yours obediently,

WILLIAM B. WHALL.

Liverpool, January 10, 1882.

BOOKS RECEIVED.

Tide Tables for the Indian Ports for the year 1882 (*also December*, 1881 *and January*, 1883). By Captain A. W. Baird, R.E., in charge of Tidal and Levelling Operations, Survey of India; and E. Roberts, F.R.A.S., Nautical Almanac Office, London. By authority of the Secretary of State for India in Council.

We last year noticed the excellence of the Tide Tables issued by the authority of the Indian Government, especially in respect to their giving the times and heights, not only of high water, but of low water. In the Tables for 1882, the number of ports for which the elements are now published, has been extended by seven, and thus they include Aden, Kurrachee, Okha Point and Beyt Harbour, Bombay, Karwar, Paumben Pass, Madras, Vizagapatam, River Hooghly (including special tables for Diamond Harbour, Fort Gloster and Kidderpore), Rangoon, Moulmein, and Port Blair. The usual care appears to have been bestowed on their production, and their application to chart soundings is very clear.

"*Wrinkles*" *in Practical Navigation*. By Captain S. T. S. Lecky, R.N.R., F.R.A.S., F.R.G.S., extra master: passed in steam, compass adjustment, &c., London: George Philip and Son, 1881.

The author of this work states in his preface that "the particular aim of the treatise is to furnish seamen with thoroughly

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practical hints, such as are not found in the ordinary works on Navigation," and he has stuck to his text. The work abounds in excellent and sound advice on every subject and science with which a navigator should be acquainted; and in discussing instruments, books, and methods, though there are no novelties, there is much practical information that will be serviceable alike to old and young. It will be sufficient if we here indicate the ranges over which "Wrinkles" extend. In the first part, after enumerating the works of which a nautical library should consist, and the instruments necessary for safe navigation, there are valuable remarks on the mariner's compass and on important facts connected with it; the marine chronometer; the sextant; the artificial and sea horizons; charts; the parallel ruler; dividers; the pelorus, with remarks on azimuths; the station pointer; sounding machines and logs; the marine binocular and telescope; the mercurial and aneroid barometers and weather log. The second part discusses the various methods for determining latitude, time, and longitude; the method of compass adjustment; notes on finding the error and rate of a chronometer; remarks on fog and floating ice; the composition and resolution of forces and motions; shaping the course; the danger angle and correct determination of distance from land,—the latter a very important subject seeing how many vessels are reported to be lost on uncharted dangers three or four miles distant from the shore, when all the while the loss has occurred on well-known rocks as near to the coast as a mile, or even less; concluding with observations on tides, currents, waves and breakers.

While giving the work the fullest praise for its intent and purpose, and the judicious treatment of the various subjects it discusses, we cannot refrain from stating that there are two or three blemishes which mar the otherwise excellent character of the "Wrinkles." Under the heading of "chronometers" the personal reference on p. 36 should never have appeared; and the observations on "blue backs" on pp. 59 and 60, ignore altogether the valuable work of private enterprise, which by competition acts as a stimulant to the Official Department to keep up with

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the necessities of the times, and increases the number of the channels by means of which useful knowledge is distributed for the benefit of navigation. Besides, it is permissible to the seaman to navigate by whatever chart he chooses; and to show that the "blue-backs" are not quite the contemptible "second-hand" things the author of "Wrinkles" would have his readers suppose, we may quote the authority of Capt. Sir Frederick Evans, Hydrographer to the Admiralty, who, in a paper read before the British Association at its last meeting, on the subject of "Oceanic Discovery and Research during the half-century 1831-81," says—"hydrography was then, as now, well represented by well-known private firms, especially in London, and whose labours command the respect of all navigators—the names of Norie, Purdy, Laurie, Imray, Findlay, scarcely require quotation." In a second edition of his book we trust Captain Lecky will re-write these pages, after taking a wrinkle from our article on "Charts in the Wreck Commissioner's Court," which he will find in the October number of the *Nautical Magazine* for 1881, pp. 778 to 782.

A Tide Table for 1882; *containing the Times of High Water at London Bridge, and the depths on the sill of the Shadwell lower entrance of the London Docks, and showing the possible Overflows.* By E. Roberts, F.R.A.S. London: Taylor and Francis.

Mr. Roberts of the Nautical Almanack Office having recently been enabled to improve the predictions of the tides for the river Thames, has published this tide table for London for 1882, in the form of a large wall-card. It is to be noted that both the flow of the times, and the heights differ from those of the Admiralty Tables, but this arises from the introduction of a correction for the *diurnal inequality*; and we believe that this is the first instance of this correction being included in any tidal prediction for the Thames. In addition to the times and heights, the table shows in conspicuous red figures the possible *overflows* that may occur, and this information is especially needed for 1882 since the astronomical conditions in certain lunations in seven months of the year, but more particularly in Februrary, March, August and

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September, are more than ordinarily favourable to the formation of very high tides. Attention is also drawn to the atmospheric conditions that tend to augment the height of the water; these are also printed in red; so that every information that can be given beforehand is clearly stated, and conspicuously under view at a glance. A small slip that accompanies the tables will no doubt be read with interest by many, as it gives a brief synopsis of tidal phenomena, and explains the cause of the range of spring tides at London Bridge, being now about twenty-two inches more than it was some 20 to 25 years back. We trust the sale may be such as to encourage Mr. Roberts to isssue his Thames tide table every year.

I. *The Arabian Sea, including Ceylon, the Gulf of Persia, entrance to the Red Sea, and Zanzibar.*

II. *Curves of Equal Magnetic Variation, for the Indian Ocean, &c., as far south* as Lat. 20° S. and between Long. 30° to 110° E.

These are two charts recently issued by the Marine Survey Department of India. The first embraces the navigation in which native craft are largely engaged, viz., between lat. 30° N. and 7½° S., and between long. 38° and 84° E.: it will also be useful to those of our own vessels that are constantly trading in Indian waters; the spare spaces are well filled with good plans of Madras, Kurrachee, Bombay, Colombo, Galle, Zanzibar, and Small strait between Perim Island and the main. This chart is to be specially commended for its abundant information, clearly laid down.

The variation chart not only shows the declination of the magnetic needle, but, by colours, the annual change.

Quarterly Weather Report of the Meteorological Office. (*New Series.*) *Part I. January-March*, 1876: Published by the Authority of the Meteorological Council.

This report, which appears to be the commencement of a new series, is as usual, full of meteorological data arranged in tabular form and diagrams illustrative of atmospheric phenomena. This much for the close student of weather characteristics. But there is also much that will interest the general reader and casual observer; especially that part at the beginning which

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explains the meteorological terms now in general use; also the tables which illustrate the cyclonic systems and gales, as well as the anti-cyclones that have crossed our islands during the quarter. The general summary of the quarter is also good, brief and to the purpose; accompanied by a monthly wind chart showing the general prevalence of the direction of the wind; and a monthly weather chart showing the distribution of mean pressure, the movements of depressions, the distribution of mean temperature, rainfall, &c. Some of the diagrams, which are on an entirely new basis, are exceedingly instructive.

Lighthouse Map of the Province of South Australia, 1881.

This is a small sketch-chart of the colony of South Australia, on which the lights on the coast are shown in such a manner that he who possesses a copy can at a glance distinguish the characteristics of the various lights. There is also a tabular list of the 23 lights by which the colony is illuminated for the benefit of shipping. The chart shows that the colony is always to the fore when need be.

MARINE INVENTIONS.

Monthly List of Patents—Compiled for this Journal by Messrs. W. P. Thompson and Boult, British and International Patent and Trademark Agents and Consulting Engineers, 323, *High Holborn, London, W.C.; Berridge Street, Leicester; also by Messrs. W. P. Thompson & Co.*, 6, *Lord Street, Liverpool.*

NEW PATENTS.

5612. Francis Melville Duncan, of Fitzroy Place, Glasgow. "A revolving buoy, to be driven by the action of tide or stream, and having a warning bell or gong attached."

5637. Ralph John Smith, of John Street, Sunderland. "Improved means and apparatus for automatically controlling the action of marine engines and their screw propellers."

5666. Adam Burdess, of Coventry, in the County of Warwick. "A new or improved apparatus for propelling or assisting in the propulsion of small boats."

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5672. Robert Evans, of Sandhill, Quay Side, Newcastle-on-Tyne. "An improvement in ship compasses, and the method of fixing and working such compasses to indicate and correct the local attraction in iron, steel, and other ships."

5675. William Munton Bullivant, of 72, Mark Lane, London. "Improvements in floating anchors, to enable disabled steamers and other vessels to ride out heavy gales, and for other like uses."

5703. William Cooke, and Daniel Mylchreest, of Liverpool, Lancaster. "Improvements in ships' stern posts and rudders."

5708. John Knock, of Hasskeni, on the Golden Horn, Turkey. "Improvements in the manufacture of anchors and apparatus for that purpose."

5728. John McFarlane Gray, of Lonsdale, Edinburgh. "Improvements in signalling by sound between vessels at sea, and apparatus connected therewith."

5732. Heinrick Ressel, of Vienna, Austria. "Improvements in and relating to means for facilitating the towing of lighters and similar vessels." (A communication.)

13. William Godson Little, of Doncaster, York, and Benjamin Nickels, of 104, Leadenhall Street, London. "Improvements in compositions suitable for coating ships' bottoms."

43. Edward Moxon, of St. Helena, Tunbridge Wells, Kent. "Improvements in the construction of barges and other similar vessels."

216. Thomas Cockshott, of East Greenwich, Kent, and Henry Martin Goodman, of Catford, Kent. "An improved apparatus for preventing the fouling of anchor chains and telegraph or other cables connected to or on board lightships, when swinging with the tide, or under any other circumstances, and to enable anchor mooring cable or telegraph cable to be cleared from each other."

2291. May 28, 1881. Price 6d. John Neil and Lorimer Corbett, both of the City of Glasgow, in the County of Lanark, North Britain. "Improvements in the propulsion, steering and manœuvering of steamships or vessels, and in the construction of propellers and mechanism therefor." The improved propeller employed according to this invention consists, according to one modification, of two or more screwed blades, the points of which are broader

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than the roots or central parts, the sides converging in straight or nearly straight lines towards the boss. A two-bladed propeller of this construction thus resembles a long flat plate narrowed towards the centre and twisted on either side of the centre to form a screw or oblique blade preferably increasing in pitch towards the point. A four-bladed screw consists of two such double blades with a large central boss cast or fitted between them so that the blades do not all converge towards each other on the boss as usual, but each pair of blades is distinct and separate. The screws may be fitted in the usual way, but, preferably, one is mounted on each side of the vessel, nearly amidships, and are driven from vertical shafts by machinery, forming an important part of the invention, but such machinery could not be properly explained without reference to the drawings. The action, however, is such that either screw can be turned in the arc of a circle. When the course of the vessel is straight ahead, both screws stand in a line to answer to the ship's length. When the ship is to turn one or the other screws is turned, so that it stands in line parallel or approximately parallel to the ship's length. The bows and bottom of the ship are so formed as to accommodate the two screws and to admit the free flow of water to the latter.

2340. May 27, 1881. Price 6d. Thomas Turton, of Liverpool, in the county of Lancaster, iron and steel manufacturer, and George Allibon, in the same place, engineer. "Improvements in the manufacture of screw-propellers and in apparatus employed therein." This invention has for its object so to manufacture screw-propellers as to prevent their corrosion and "pitting." To this end the screws are to be produced, from iron and steel, in the usual way, cleaned by acids, and dropped in a bath of molten zinc or like metal, so that they become coated with the latter. To avoid the necessity for melting a large quantity of zinc, a bath is provided with radial "bays," each receiving one blade of the propeller, and uniting at the centre where the boss is. To provide light and economical plant for coating, the screw is slung and dipped, first in the acid, then in the molten metal.

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TIDE TABLES FOR FEBRUARY, 1882.

Also Ports of Reference for the Constants in the next Table.

Week Day.	Month Day.	LONDON BRIDGE.		HULL.		NORTH SHIELDS		LEITH.		DEVONPORT.		DOVER.		WESTON-SUPER-MARE.		LIVERPOOL.		GREENOCK.		QUEENSTOWN		KINGSTOWN.		LONDONDERRY.		BREST.	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M	P.M.
		H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
W	1	0 50	1 14	5 23	5 42	2 22	2 42	1 17	1 38	4 22	4 47	10 2	10 23	5 41	6 4	10 17	10 36	10 58	11 19	8 52	4 13	10 12	10 30	6 57	7 18	2 42	3 1
Th	2	1 35	1 56	6 2	6 22	3 1	3 19	1 57	2 16	5 8	5 29	10 43	11 3	6 26	6 46	10 55	11 13	11 40	Mid.	4 34	4 53	10 47	11 4	7 38	7 56	3 20	3 38
F	3	2 15	2 31	6 41	6 59	3 36	3 52	2 34	2 50	5 48	6 5	11 22	11 40	7 4	7 21	11 30	11 47	—	0 18	5 11	5 28	11 20	11 36	8 13	8 28	3 55	4 12
S	4	2 46	3 2	7 16	7 32	4 8	4 24	3 5	3 20	6 22	6 38	11 57	—	7 38	7 54	—	0 3	0 35	0 51	5 44	6 0	11 52	—	8 42	8 56	4 28	4 44
S	5	3 19	3 33	7 48	8 3	4 39	4 54	3 35	3 50	6 53	7 8	0 14	0 31	8 9	8 23	0 19	0 34	1 7	1 23	6 16	6 31	0 8	0 24	9 10	9 24	4 59	5 14
M	6	3 48	4 3	8 17	8 31	5 9	5 24	4 4	4 19	7 22	7 36	0 47	1 3	8 37	8 51	0 49	1 4	1 39	1 54	6 46	7 1	0 39	0 54	9 38	9 52	5 28	5 42
Tu	7	4 19	4 33	8 46	9 1	5 40	5 56	4 35	4 51	7 50	8 5	1 19	1 35	9 5	9 19	1 19	1 34	2 8	2 23	7 16	7 31	1 9	1 25	10 6	10 21	5 56	6 11
W	8	4 49	5 5	9 17	9 33	6 12	6 28	5 7	5 23	8 20	8 35	1 51	2 8	9 33	9 47	1 49	2 4	2 38	2 53	7 46	8 2	1 41	1 57	10 36	10 53	6 27	6 44
Th	9	5 19	5 35	9 50	10 7	6 45	7 3	5 40	5 59	8 50	9 5	2 25	2 43	10 1	10 16	2 20	2 36	3 9	3 25	8 18	8 35	2 14	2 33	11 12	11 35	7 1	7 19
F	10	5 50	6 9	10 25	10 46	7 23	7 45	6 19	6 41	9 21	9 41	3 1	3 20	10 32	10 50	2 53	3 13	3 42	4 2	8 53	9 14	2 52	3 13	—	0 1	7 40	8 2
S	11	6 30	6 52	11 11	11 41	8 10	8 38	7 5	7 33	10 4	10 29	3 41	4 4	11 11	11 37	3 35	4 0	4 24	4 48	9 36	10 2	3 37	4 4	0 34	1 5	8 26	8 55
S	12	7 17	7 48	—	0 16	9 11	9 49	8 6	8 44	10 57	11 30	4 30	5 0	—	0 8	4 31	5 8	5 16	5 49	10 34	11 13	4 36	5 12	1 43	2 26	9 20	10 9
M	13	8 22	9 2	0 53	1 31	10 32	11 15	9 27	10 10	—	0 11	5 35	6 14	0 46	1 30	5 51	6 37	6 28	7 10	11 56	—	5 51	6 31	3 10	3 51	10 55	11 41
Tu	14	9 49	10 34	2 11	2 51	11 55	—	10 52	11 30	0 55	1 40	6 55	7 38	2 15	3 0	7 23	8 5	7 53	8 36	0 39	1 23	7 11	7 51	4 28	5 1	—	0 24
W	15	11 14	11 56	3 31	4 8	0 35	1 10	—	0 4	2 24	3 5	8 18	8 52	3 43	4 22	8 42	9 13	9 15	9 49	2 5	2 41	8 28	9 1	5 29	5 55	1 3	1 36
Th	16	—	0 29	4 39	5 8	1 40	2 7	0 34	1 1	3 42	4 14	9 22	9 49	4 57	5 29	9 41	10 6	10 19	10 46	3 12	3 40	9 32	10 0	6 21	6 46	2 5	2 31
F	17	0 58	1 22	5 32	5 56	2 31	2 54	1 26	1 50	4 42	5 9	10 15	10 40	5 57	6 23	10 29	10 52	11 12	11 37	4 6	4 31	10 23	10 44	7 11	7 35	2 54	3 17
S	18	1 48	2 11	6 20	6 43	3 16	3 38	2 13	2 35	5 35	6 0	11 5	11 30	6 48	7 12	11 15	11 38	—	0 2	4 55	5 19	11 5	11 26	7 58	8 20	3 40	4 3
S	19	2 33	2 55	7 6	7 29	4 0	4 22	2 57	3 18	6 25	6 49	11 55	—	7 36	7 58	—	0 1	0 26	0 50	5 43	6 6	11 49	—	8 40	9 0	4 26	4 48
M	20	3 17	3 37	7 52	8 13	4 41	5 6	3 39	4 0	7 11	7 31	0 20	0 43	8 19	8 39	0 24	0 45	1 13	1 35	6 27	6 48	0 12	0 34	9 20	9 40	5 8	5 29
Tu	21	3 59	4 20	8 34	8 55	5 27	5 49	4 22	4 44	7 51	8 11	1 6	1 29	8 59	9 19	1 6	1 27	1 56	2 17	7 9	7 30	0 56	1 18	10 0	10 20	5 50	6 11
W	22	4 42	5 8	9 16	9 37	6 11	6 33	5 6	5 28	8 31	8 51	1 51	2 13	9 38	9 57	1 48	2 9	2 38	2 59	7 51	8 12	1 40	2 2	10 41	11 3	6 32	6 54
Th	23	5 23	5 45	9 58	10 20	6 55	7 18	5 50	6 13	9 9	9 28	2 35	2 57	10 14	10 33	2 36	2 51	3 19	3 39	8 34	8 52	2 24	2 47	11 27	11 57	7 16	7 38
F	24	6 6	6 29	10 44	11 12	7 43	8 11	6 38	7 5	9 49	10 11	3 19	3 42	10 51	11 13	3 12	3 35	4 1	4 24	9 14	9 38	3 11	3 37	—	0 30	8 2	8 38
S	25	6 52	7 19	11 43	—	8 40	9 14	7 35	8 8	10 35	11 2	4 6	4 32	11 39	—	4 2	4 33	4 50	5 18	10 6	10 38	4 6	4 35	1 7	1 47	8 57	9 31
S	26	7 50	8 24	0 18	0 55	9 53	10 35	8 46	9 28	11 33	—	5 2	5 37	0 10	0 49	5 10	5 53	5 51	6 29	11 15	11 58	5 14	5 53	2 30	3 13	10 11	10 58
M	27	9 4	9 53	1 34	2 14	11 18	Mid.	10 15	10 53	0 10	0 54	6 17	6 58	1 34	2 18	6 42	7 27	7 18	7 57	—	0 43	6 34	7 14	3 54	4 31	11 44	—
Th	28	10 38	11 20	2 54	3 33	—	0 38	11 31	—	1 36	2 16	7 38	8 16	3 1	3 41	8 7	8 42	8 38	9 15	1 25	2 3	7 52	8 27	5 8	5 31	0 26	1 2

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TIDAL CONSTANTS

For Various British, Irish, and European Ports.

By applying the Tidal Constant of the place, according to its sign (+ *add*, − *sub.*), to the time of high water on the given day at the port of reference, you have the time of high water at the place sought.

Place.	Constant. H. M.	Port of Reference.
Aberdeen	−1 17	Leith
Aberystwyth	−3 52	Liverpool
Alderney	+2 59	Brest
Antwerp	+5 13	Dover
Arbroath	−0 42	Leith
Arcachon	+0 50	Brest
Arklow	−2 25	Kingstown
Ayr	−0 18	Greenock
Banff	−1 49	Leith
Bantry harbour	−1 14	Queenstown
Barnstaple bridge	−0 26	Weston-s.-Mare
Bayonne	−0 2	Brest
Beachy head & Rye bay	+0 8	Dover
Beaumaris	−0 51	Liverpool
Belfast	+2 42	Londonderry
Berwick	−1 5	N. Shields
Blyth	−0 8	N. Shields
Bordeaux	+3 3	Brest
Boulogne	+0 13	Dover
Bridport	+0 22	Devonport
Bristol & King Road	+0 19	Weston-s.-Mare
Cadiz	−2 2	Brest
Caernarvon	−1 56	Liverpool
Calais	+0 37	Dover
Campbellton	−0 23	Greenock
Cardiff	+0 2	Weston-s.-Mare
Cardigan bar	−4 22	Liverpool
Carlingford bar	−0 10	Kingstown
Chatham	−0 47	London
Cherbourg	+4 2	Brest
Coleraine	−1 37	Londonderry
Coquet Road	−0 23	N. Shields
Cordouan Tower	−0 10	Brest
Cowes (West)	−0 27	Dover
Crinan	+4 41	Greenock
Cromarty	−2 21	Leith
Dartmouth	+0 33	Devonport
Deal & Downs	+0 8	Dover
Dieppe	+7 19	Brest
Donaghadee	+0 3	Kingstown
Donegal harbour	+0 17	Queenstown
Douglas & Ramsay	−0 11	Liverpool
Dublin bar	+0 2	Kingstown
Dundalk	−0 16	Kingstown
Dungeness	−0 27	Dover
Dunkerque	+0 56	Dover
Exmouth	+0 38	Devonport
Falmouth	−0 46	Devonport
Fecamp	+6 57	Brest
Ferrol	−0 47	Brest
Flamborough head	−1 59	Hull
Fleetwood	−0 12	Liverpool
Folkestone	−0 5	Dover
Fowey	−0 29	Devonport
Flushing	+1 42	Dover
Galway bay	−0 26	Queenstown
Gibraltar	−1 27	Brest
Glasgow (Port)	+0 10	Greenock
Gloucester	+2 51	Weston-s.-Mare
Granville	+2 26	Brest
Gravesend	−0 48	London
Grimsby (Great)	−0 53	Hull
Guernsey (St. Peter)	+2 50	Brest
Hartlepool	+0 5	N. Shields
Harwich	−1 52	London
Havre	+6 4	Brest
Helgoland	+0 21	Dover
Holyhead	−1 12	Liverpool
Holy Island harbour	−0 53	N. Shields
Honfleur	+5 42	Brest
Inverness	−1 59	Leith
Jersey (St. Helier)	+2 38	Brest
Kinsale	−0 18	Queenstown
Lerwick (Shetland)	−3 47	Leith
Limerick	+1 15	Queenstown
Lisbon bar	−1 17	Brest
Littlehampton	+0 24	Dover
Llanelly bar	−0 38	Weston-s.-Mare
Lowestoft	−4 1	London
Lynn & Boston Deep	−0 29	Hull
Margate	−2 18	London
Maryport	+0 3	Liverpool
Milford Haven entr.	−0 58	Weston-s.-Mare
Montrose	−0 52	Leith
Morlaix	+1 6	Brest
Needles point	−1 26	Dover
Newcastle	+0 23	N. Shields
Newhaven	+0 39	Dover
Newport	+0 16	Weston-s.-Mare
Nieuport	+1 6	Dover
Nore	−1 28	London
Orfordness	−2 43	London
Oporto	−1 17	Brest
Ostende	+1 13	Dover
Padstow	−1 41	Weston-s.-Mare
Peel, Isle of Man	−0 15	Liverpool
Pembroke Dock	−3 42	Weston-s.-Mare
Penzance	−1 13	Devonport
Peterhead	−1 43	Leith
Piel harbour, Barrow	−0 18	Liverpool
Plymouth breakwater	−0 6	Devonport
Poole	−2 2	Dover
Port Carlisle	+0 47	Liverpool
Portland breakwater	+1 18	Devonport
Port Patrick	−0 58	Greenock
Portsmouth	+0 29	Dover
Ramsgate	−2 19	London
Rotterdam	+4 33	Dover
Santander	−0 17	Brest
Scarborough	+0 48	N. Shields
Selsea bill	+0 33	Dover
Sheerness	−1 21	London
Shoreham	+0 22	Dover
Sligo bay	+0 17	Queenstown
Southampton	−0 42	Dover
Spurn point	−1 3	Hull
St. Ives	−2 10	Weston-s.-Mare
St. Malo	+2 18	Brest
St. Mary (Scilly)	−1 16	Devonport
St. Nazaire	−0 7	Brest
Stornoway	+6 38	Greenock
Stromness (Orkneys)	−5 17	Leith
Sunderland	−0 1	N. Shields
Swansea bay	−0 53	Weston-s.-Mare
Tay bar	−0 11	Leith
Tees bar	+0 22	N. Shields
Tenby	−1 12	Weston-s.-Mare
Thurso	−5 49	Leith
Torbay	+0 17	Devonport
Tralee bay	−0 58	Queenstown
Ushant (Ouessant)	−0 15	Brest
Valentia harbour	−1 19	Queenstown
Waterford	+0 19	Queenstown
Westport	−0 4	Queenstown
Wexford	+2 20	Queenstown
Whitby	+0 22	N. Shields
Whitehaven	−0 9	Liverpool
Wick	−2 55	Leith
Wicklow	−0 41	Kingstown
Workington	−0 19	Liverpool
Yarmouth road	−4 43	London
Youghall	+0 18	Queenstown

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MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
38	England—East Coast—Dudgeon Light	Intended alteration in character.
39	„ „ „ Lynn Well Light	Intended alteration in character.
40	„ „ „ The Wash	Intended alteration in buoyage
41	„ West Coast—Liverpool Bay—Crosby Channel	Pillar bell-beacon sunk, buoy in its place.
42	„ „ „ Bristol Channel—Scarweather Sand	Alteration in West buoy.
43	Ireland—S.W. Coast—Bantry Bay—Dursey Island	Intended light.
44	„ S.E. Coast—Wexford South Bay—Long Bank and Holden Bed	Alteration in buoyage.
45	„ East Coast—Arklow Bank—N. Arklow Light-vessel	Light vessel with three masts.
46	North Sea—Belgium—Ostende	Dredger signals.
47	„ Maas River—Mallegat Channel	New light, and Krabbe lights discontinued.
48	„ Elbe River—Mielstacks	Light re-exhibited.
49	Baltic Entrance—Little Belt—Æro Island—Skioldness	New light; intended fog-signal.
50	„ „ Great Belt—Agerso Sound	Torpedo ground.
51	Baltic—Sweden—S. Coast—Utklippor Rocks	Sector of red light introduced.
52	France—N. Coast—Havre	Gas buoy at entrance.
53	„ W. Coast—Vendée—Goulet de Fromantine	Leading lights for channel.
54	„ „ Gironde River—Point de la Palmyre	Electric light.
55	Mediterranean—France—Marseille—Jolliette Basin	Light replaced.
56	„ Malta—Valetta	New time-signal.
57	„ Adriatic—Trieste Gulf—Grado	Gas buoy withdrawn.
58	„ „ Quarnero Gulf—Sansebo Island	Particulars of Mount Barbe light.
59	„ „ Dalmatia—Spalato	Alteration in light on mole head.
60	„ „ Puntadura Island	New Harbour lights.
61	„ „ Brazza Island—Ports Milna and St. Martino	New Harbour lights.
62	„ „ Lesina Island—Citta Vecchia	New Harbour light.
63	„ Greece—Salamis Bay—Peirœus	Position of green light; harbour improvements.
64	„ Cyprus—S. Coast—Limasol	New Harbour light.
65	Black Sea—Kertch Strait—Yenikali	Deep channel open.
66	Indian Ocean—Madagascar—N.W. Coast—Passandava Bay	New shoal discovered.
67	India—W. Coast—Beypore	Position of anchorage buoy.
68	„ Bay of Bengal—Madras	Buoys marking entrance to harbour.
69	Malacca Strait—Penang—George Town	New light on Fort point.
70	„ Formosa Bank	New light-vessel.
71	Eastern Archipelago—Java Sea—Bawean Island	Confirmation of rock to north-eastward.

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MONTHLY ABSTRACT OF NAUTICAL NOTICES—*continued.*

No.	PLACE.	SUBJECT.
72	CHINA—E. Coast—Canton River—Macao Fort Rock	Buoy showing *green* light.
73	AUSTRALIA—E. Coast—Montagu Island	Permanent light exhibited.
74	„ „ Brisbane River Bar	East beacon light discontinued.
75	SOUTH AUSTRALIA—St. Vincent Gulf—Port Adelaide	Leading lights to enter river.
76	NORTH PACIFIC—Hawaii Islands—Molokai Island	New light.
77	CANADA—Nova Scotia—Cape Canso—Cranberry Island	Temporary lights to replace those destroyed by fire.
78	„ St. Lawrence, gulf and river	Telegraph and signal stations.

NAUTICAL NOTICES.

All Bearings Magnetic, unless otherwise stated.

38.—ENGLAND.—*East Coast.—Dudgeon Light—Intended alteration in Character.*—It is intended in the spring of 1882, to make the following alteration in the character of the light exhibited from Dudgeon light-vessel, eastern approach to Lynn Deeps. The light (at present fixed white) will be a *double flashing* light—*one white flash* and *one red flash* following each other in quick succession *every half-minute*. The red flash will be as nearly as possible equal in power with the white flash, and the approximate proportions of time will be—white flash, *two and a half seconds;* darkness, *two and a half seconds;* red flash, *two and a half seconds;* darkness, *twenty-two and a half seconds*. Further notice will be given.

39.—ENGLAND.—*East Coast.—Lynn Well Light.—Intended Alteration in character.*—It is intended in the spring of 1882, to accelerate the revolution of the light exhibited from Lynn Well light-vessel, entrance to Lynn Deeps: The light (at present revolving white every twenty seconds) will be *revolving* white *every ten seconds*. Further notice will be given.

40.—ENGLAND.—*East Coast.—Buoyage of the Wash.*—With a view of facilitating the navigation of the channel leading from Blakeney Overfalls to Lynn Deeps, it is intended to place shortly an 8-feet conical buoy, with staff and cage, to mark the Bridgirdle sand. Also, an 8-feet conical buoy, with staff and globe, to mark the Gore Middle sand. Further notice will be issued.

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41.—ENGLAND.—*West Coast.—Liverpool Bay.—Crosby Channel.—Pillar Bell Beacon Sunk.*—This beacon, south-westward of Crosby light-vessel, being sunk, a red *can* buoy with perch (the same as that formerly placed in the position), has been substituted therefor.

42.—ENGLAND.—*West Coast.—Bristol Channel.—Alteration in Position of the West Scarweather Buoy.*—In consequence of the Scarweather sand having grown up to the westward, it has been considered necessary to move the West Scarweather buoy about half-a-mile N.W. by W. from its former position, and it now lies in 5 fathoms at low water spring tides, with the following marks and bearings, viz.:—A large white house open east of the Mumbles lighthouse, N. ¼ E.; Cwm Bychan chimney in line with the entrance to Port Talbot, N.E. ¾ E.; Scarweather light-vessel, S.W. (distant $1\frac{6}{10}$ths mile); Oyster buoy, N.N.W. W^{ly}. (distant 4 miles); Mumbles lighthouse, N. ¼ E. (distant $6\frac{1}{10}$th miles).

43.—IRELAND.—*S.W. Coast.—Bantry Bay Approach.—Intended Light on Dursey Island.*—On or about the 1st of February, 1882, a similar light to that recently shown from the Calf rock lighthouse will be exhibited from a temporary lighthouse on the south-west extremity of Dursey island. It will be a *flashing white* light, showing a flash *every fifteen seconds*, visible between the bearings of S.W. ½ S. through E. and W.N.W.; elevated about 200 feet above high water, and visible from a distance of 16 miles. *Variation*, 24° *W.*

44.—IRELAND.—*S.E. Coast.—Wexford South Bay.—Alteration in Position of the Long Bank and Holden Bed Buoys.*—In consequence of that part of the Long bank called Holden Bed having extended to the S.S.W. 5 cables, the buoys marking the south end of the Long bank and Holden Bed will be shifted to the following positions, on or about the 1st January, 1882, viz.:—*South Long bank* No. 3 *buoy* will be shifted 3 cables to the N.N.E. from its present position, and will be moored in 5 fathoms, 3½ cables from south edge of bank. And *Holden's Bed buoy* will be shifted 4½ cables, S. by W. ¾ W. from its present position, and will be moored in 7½ fathoms, 2 cables from south edge of bank.

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45.—IRELAND.—*East Coast.—Arklow Bank.—North Arklow Light-vessel.*—In consequence of North Arklow light-vessel having been run into and damaged, it has been found necessary to replace her by another light-vessel, having three masts instead of one mast and a jigger mast.

46.—NORTH SEA. — *Belgium. — Ostende. — Signals used by Dredger.*—From 3rd December, 1881, the following signals would be shown from the dredger at work on the bar at Ostende, to indicate the direction in which she is about to move, so as to afford room to vessels passing. During the day these signals will be made by a red flag, and at night by a white light. When the dredger is shortening in cable, the signal will be shown aft, and when veering cable, it will be shown forward. Vessels should if possible pass ahead of the dredger when the signal is shown forward, and astern of her when it is shown aft.

Note.—The dredger is at work both night and day, and is at times so placed as to render entry difficult—caution is specially required by vessels entering the harbour without a pilot.

47.—NORTH SEA.—*Maas River.—Mallegat Channel.—Light at Northern Entrance, Krabbe Lights Discontinued.*—A light is exhibited from the west point of the northern entrance to the Mallegat, below Dordrecht. It is a *fixed white* light. The lighthouse, constructed of iron, is placed on the stone mole. Position, lat. 51° 48′ 20″ N., long. 4° 38′ 40″ E. Consequent on the exhibition of Mallegat light, the lights at the west side of the northern entrance to the Krabbe gat would be discontinued.

48.—NORTH SEA.—*Elbe River.—Mielstacks Light Re-Exhibited.*—The light near Mielstacks, south bank of Elbe river, was re-exhibited.

49.—BALTIC ENTRANCE.—*Little Belt.—Æro Island.—Light on Skiold Ness, intended Fog-signal.*—With reference to notice to mariners, in 1881, on the intended exhibition of a light from a lighthouse erected 343 yards from the north-west extreme of Æro island; and the establishment of a fog-signal near the lighthouse, the light is now exhibited; it shows a *white flash every thirty seconds;* elevated 106 feet above the sea, and visible from a distance of 15 miles. The lighthouse, 57 feet high, is

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constructed of granite. Position, lat. 54° 58′ 10″ N., long. 10° 12′ 40″ E.

Note.—When the fog-signal is established notice will be given in due course.

50.—BALTIC ENTRANCE.—*Great Belt.—Torpedo Ground in Agersö Sound.*—The southern part of Agersö sound, on the south-west side of Sicelland, has been appropriated as a station for torpedo experiments. This station (with submarine cable in connection) extends as far as Stigness (Stigsnœs)—about 40 feet E.S.E. of the locality a green buoy has been placed, and 40 feet W.S.W. a floating beacon with green flag.

Note.—Vessels are prohibited from anchoring or passing between these sea marks. *Variation*, 12¼° *W.*

51.—BALTIC.—*Sweden.—South Coast.—Utklippor Rocks Light.—Sector of Red Light.*—With reference to notice in 1881, the sector of *red* light from Utklippor (Utklippan or Utklipporna) light-house is shown between the bearings of S. 21° E. (through south) and S. 60° W. *Variation*, 10¼° *W.*

52.—FRANCE.—*North Coast.—Havre.—Buoy Lighted by Gas at Entrance.*—The buoy marking the one-foot patch—on the starboard hand entering the southern channel of Havre—has been replaced experimentally by a buoy lighted with gas, showing a *fixed red* light.

53.—FRANCE.—*West Coast.—Vendée.—Goulet de Fromantine.—Leading Lights for Channel.*—Two leading lights now indicate the channel for entering the Goulet de Fromantine, to vessels approaching from the westward:—(1.) Light for proceeding up the channel—A *fixed white* light, illuminating about five-eighths of the horizon, elevated 18 feet above high water (15 feet above the ground), and visible from a distance of about 5 miles. This light is shown from a square wooden shed with standard painted black, situated on the shore 109 yards southward of the barricade of piles of Fromantine. Position, lat. 46° 53′ 30″ N., long. 2° 8′ 55″ W. (2.) Light for proceeding down the channel—A *fixed white* light visible through an arc of about 30°, elevated 39 feet above high water (20 feet above the ground), and visible in the centre of the sector from a distance of about 10 miles. This

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light is shown from a square wooden shed painted black, placed back to back with la Croix beacon (black).

54.—FRANCE.—*Gironde River Entrance.—Electric Light on Point de la Palmyre.*—The light exhibited on Point de la Palmyre, northern side of Gironde river entrance, has been changed to an *electric* light. It is, as previously, an *alternating red* and *green* light at intervals of *twenty seconds*, without eclipses—elevated, as before, 167 feet above high water (98 feet above the ground), but should now be visible from a distance of about 19 miles.

55.—MEDITERRANEAN.—*France.—Marseille.—Eastern Light of Joliette Basin South Entrance.*—The eastern of the two red lights at the southern entrance of Joliette basin, Marseille (which on account of widening the pass had been temporarily placed on a wooden platform in the South Outer port), is now replaced on the Eastern quay of Traverse de la Major. The light, 20 feet within the quay head, is elevated 20 feet above high water (16 feet above the ground).

56.—MEDITERRANEAN.—*Malta—Time Signal at Valetta.*—Established on the top of the port office, Grand harbour, Valetta. The signal is a ball, painted black, 4½ feet in diameter with drop of 14 feet, hoisted on a staff 59 feet above high water. The signal is made as follows:—The ball is hoisted close up 5 minutes before noon, and dropped at noon. Local mean time, equivalent to 23 hrs. 1′ 55″ Greenwich mean time. Dropping the ball at the Palace tower, and firing the gun will be continued as previously with the following alterations, viz.:—The gun will be fired on the dropping of the ball at the port office, and the ball at the Palace tower dropped on the flash of the gun. The accuracy of the latter signal cannot be guaranteed within half or one second.

Note.—The signal is not made from the port office on Sundays or public holidays, but will be made on those days, as formerly.

57.—MEDITERRANEAN.—*Adriatic.—Gulf of Trieste.—Buoy lighted by Gas near Grado withdrawn, Bell Buoy replaced.*—With reference to Notice in 1881, on placing experimentally, a buoy lighted by gas, seaward of Mula di Muggia bank, near Grado; and on the withdrawal of the bell buoy which previously marked the edge of the bank; the experiments being concluded, the gas buoy has been

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withdrawn, and replaced by a bell buoy, moored in the same position with the following bearings:—Grado church steeple, N.W. ¼ N.; Barbara church, N.; Duino castle, N.E. ¾ E.

58.—MEDITERRANEAN.—*Adriatic.—Gulf of Quarnero.—Sansego Island.—Particulars of Light on Mount Garbe.*—With reference to Notice in 1881, this light (*flashing white*) is elevated 341 feet above the sea, and visible from a distance of 20 miles. The light-house, 36 feet high, consists of a hexagonal wooden tower cased with masonry, and is situated on the summit of mount Garbe. Position, lat. 44° 30′ 55″ N., long. 14° 18′ 0° E.

59.—MEDITERRANEAN.—*Adriatic.—Dalmatia.—Port Spalato.—Alteration in Character of Mole Head Light.*—The new light exhibited from an iron tower at the extremity of the mole, port Spalato, is a *fixed and flashing* light—fixed during *thirty seconds*, and flashing during *thirty seconds*. Further particulars will shortly be published.

60.—MEDITERRANEAN.—*Adriatic.—Lights on Puntadura Island.*—On 29th October, 1881, two harbour lights were exhibited on the western extremity of Puntadura island, coast of Dalmatia. The lights are *fixed white*, placed vertically 29½ feet apart, and visible from a distance of about 9 miles. Position approximate, lat. 44° 19′ 35″ N., long. 15° 1′ 0″ E.

61.—MEDITERRANEAN.—*Adriatic.—Brazza Island.*—(1.) *Harbour Light at Port Milna.*—The harbour light exhibited at the entrance to port Milna, on the western side of Brazza island, is a *fixed red* light, with a sector of *green* light in the direction of Smerduglia rock. Position approximate, lat. 43° 20′ 0″ N, long. 16° 24′ 20″ E.

(2.) *Harbour Light at Port St. Martino.*—A harbour light (*fixed white*) is now exhibited at port St. Martino, on the south-eastern side of Brazza island.

62.—MEDITERRANEAN.—*Adriatic. — Lesina Island. — Harbour Light at Citta Vecchia.*—A harbour light (*fixed green*) is now exhibited at Citta Vecchia, on the north-west side of Lesina island.

63.—MEDITERRANEAN.—*Greece.—Salamis Bay.—The Peiræus.—Position of Green Light, Harbour Improvements.*—With reference to Notice in 1881, on the re-exhibition of the permanent light (green) on the south side of entrance to the Peirœus; this green

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light is exhibited from a column on Small rock (*Trapese rock*), south side of the entrance, and situated W. by S. distant about 240 yards from the red light on the northern side of the entrance. Also the pillar on which the green light was formerly placed (about 65 yards southward of the red light), has been removed; and the entrance to the port at this part widened by the removal of the former breakwater by 120 yards. The depth of water here has been increased to 24 feet as far as a buoy which has been placed near the shore on the south side; from this buoy the red light bears north, distant about 180 yards. *Variation*, 6¾° *W.*

64.—MEDITERRANEAN.—*Cyprus.—South Coast.—Harbour Light at Limasol.*—Exhibited from a mast at the extremity (187 yards from the shore) of the iron pier at Limasol, south coast of Cyprus. It is a *fixed red* light, elevated 25 feet above high water, and visible from a distance of 6 miles. The mast, 18 feet in height, is painted red. The depth at the end of the pier is 20 feet. Position on Admiralty plan, lat. 34° 39′ 50″ N., long. 33° 1′ 45″ E.

65.—BLACK SEA.—*Kertch Strait.—Yenikali Deep Channel Open to Navigation.*—With reference to Notice in 1881, on dredging operations being resumed in the deep channel of Yenikali (Enikolski or Yenikal), the dredging operations are completed, and the channel is open to navigation. The channel has a depth of 18 feet, and is marked at both entrances by two buoys. The buoys on the starboard-hand (entering the sea of Azov) are chequered black and white. Those on the port-hand are chequered red and white. In addition to these buoys, twenty pairs of floating beacons of the same colour mark the sides of the channel.

66.—INDIAN OCEAN.—*Madagascar.—N.W. Coast.—Shoal in Passandava Bay.*—This danger *(Touareg shoal)*, lying in the eastern part of Passandava bay, and on which the ship *Touareg* struck, is composed of coral, 2½ cables long in a N.N.W. and S.S.E. direction, and three-quarters of a cable in width, with a least depth over it at low water of about 11 feet—it lies with the following bearings:—North-west extreme of Nos Cumba, N. 47° E.; Point Pouhang, N. 74° W.; Tani-Keli (Ninepin islet), N. 11° W.

67.—INDIA.—*West Coast.—Beypore.—Position of Anchorage*

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Buoy.—A red buoy, with pole and basket, has been placed to mark the anchorage at Beypore. The buoy lies in 4 fathoms water, on the following bearings:—Beypore flagstaff, N.E. by E. ½ E., distant 1·4 mile; northern port boundary pillar, N. by E. ½ E., distant 2·0 miles; a remarkable round tree on Kolahcoon hill, E. by S., distant 3·9 miles. *Variation*, 0° 55′ *E.*

68.—India.—*Bay of Bengal.—Madras.—Buoys marking Harbour Entrance.*—Two buoys, painted with red and white vertical stripes, have been laid down to indicate the harbour entrance.

69.—Malacca Strait.—*Penang.—George Town.—Light on Fort Point.*—On 1st January, 1882, a light will be exhibited from a lighthouse erected on Fort point, George town, Pulo Penang, or Prince of Wales island. The light will be *fixed red*, visible through an arc of 202½°—or between the bearings of S.S.E. and north—elevated 60 feet above the sea, and should be seen from a distance of 10 miles. The lighthouse, constructed of iron and painted white, has an overhanging gallery round the lantern, and is situated on the north-east bastion of fort Cornwallis. Position, lat. 5° 24′ 30″ N., long. 100° 20′ 10″ E. *Variation*, 1¾° *E.*

70.—Malacca Strait.—*Light-vessel off Formosa Bank.*—On or about the 20th December, 1881, a light-vessel would be placed on the southward side of Formosa bank, north shore of Malacca strait. The light is *flashing white*, showing a *flash every half minute;* and visible from a distance of 10 miles. The light-vessel, painted yellow, with the words *Formosa Bank* in large white letters on her sides, carries a caged ball painted red at the mast-head, and a riding light on the fore-stay 10 feet above the rail—she is moored with the following bearings:—Mount Formosa, N. 61¼° E.; Bukit Moar, N. 33¾° W. Position as given, lat. 1° 45′ 30″ N., long. 102° 49′ E. During thick or squally weather, a gong will be sounded from the light-vessel. *Variation*, 2° *E.*

71.—Eastern Archipelago.—*Java Sea.—Rock North Eastward of Bawean Island.*—Confirmation of the existence of a rock awash, lying about 45 miles north-eastward of Bawean island, eastern part of Java sea:—This danger (*Le Bœuf rock*) was originally reported by F. Le Bœuf, master of the British barque *Annie Florence*, as having been seen breaking at 9h. a.m. on 6th February

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1879, when on the passage from Sourabaya to Singapore, the breakers were passed at the distance of about 2 miles, weather hazy. Position given as approximate, astronomical observations not being obtainable, lat. 5° 16′ S., long. 113° 21′ E. Le Bœuf rock has now been reported by P. Casfens, master of the German brigantine *Zeus*, as having been seen at 3h. p.m. on the 26th June 1881, on the voyage from Menado (Celebes) to Amsterdam. Mr. Casfens states the position above given is correct (from astronomical observations), and that the rock was apparently awash, isolated and of small extent; also, that passing half-a-mile to the northward of it, the hand lead gave no bottom at 20 fathoms, and no other appearance of danger was seen in the locality.

72.—China.—*East Coast.—Canton River.—Buoy with Green Light on Macao Fort Rock.*—A buoy, from which is exhibited a *fixed green* light, has been placed on the north-east extremity of Macao fort rock, Canton river. The buoy, 6 feet in diameter, is of wood, black, and conical in shape; it is moored in 2 fathoms at low water spring tides, with the following bearings:—Chênnam fort, S. 66° E.: northern extreme of Macao fort, S. 33¾° W. Vessels proceeding up the river should leave this buoy on the port-hand. *Variation*, ¼° *E.*

73.—Australia.—*East Coast.—Montagu Island.—Permanent Light Exhibited.*—With reference to Notice in 1880, on the exhibition of a provisional light, pending the completion of the lighthouse, on Montagu island (Barunguba). On 1st November, 1881, the provisional light would be discontinued, and the permanent light exhibited from a lighthouse erected on the summit of the island. It is a *fixed and flashing white* light, exhibiting the following characteristics—fixed *thirty seconds*, eclipsed *twelve and two-thirds seconds*, flash *four and two-thirds seconds*, and eclipsed *twelve and two-thirds seconds.* Elevated 250 feet above high water, and visible from a distance of about 20 miles. Position, lat. 36° 15′ 20″ S., long. 150° 14′ 30″ E.

Australia.—*East Coast.—Brisbane River Bar.—East Beacon Light Discontinued.*—On 21st August, 1881, East Beacon light (red), Brisbane river bar, being no longer of use, was discontinued; the lantern and beacon would also be removed as early as convenient.

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75.—SOUTH AUSTRALIA.—*St. Vincent Gulf.—Entrance to Port Adelaide.*—On and after the 18th October, 1881, leading lights would be exhibited for entering the river at night. The upper light, a powerful *red* one, and the lower light *white*. When brought in line bearing N.E. by E. nearly, they lead over the outer bar, midway between the bar buoys. Keep the lights in one, until within half a cable of the lower white light, when a course can be steered for No. 11 beacon light. These lights are 650 feet apart.

76.—NORTH PACIFIC.—*Hawaii Islands.—Molokai Island.—Light on S.W. Point.*—On and after the 1st day of January, 1882, a *fixed white* light would be established on the extreme S.W. point (known as Lae O Ka Laan) of Molokai island; elevation, 50 feet above the sea, and visible (all round the horizon) from a distance of 11 miles. The tower is painted white and the lantern red. Position, as given, lat. 21° 6′ N., long. 157° 18′ W. Mariners are especially cautioned against confounding this with the N.W. point of Molokai which bears from the S.W. point N. 8° E., distant 9 miles.

77.—CANADA.—*Nova Scotia.—Cape Canso.—Temporary Lights on Cranberry Island.*—On 8th November, 1881, or as soon after as circumstances would allow, two temporary lights would be exhibited on Cranberry island, northward of cape Canso—in lieu of those destroyed by fire on 12th October, 1881. The lights are, as previously, *fixed white;* the upper light is elevated 75 feet above highwater, and should probably be visible from a distance of 12 miles; the lower light, 40 feet above high water, should be seen from a distance of 9 miles. The lights are shown from a skeleton tower, erected close to the site of the old lighthouse. The fog-signal was also destroyed by fire. Due notice will be given when it is again put in operation.

78.—CANADA.—*St. Lawrence.—Gulf and River.—Telegragh and Signal Stations.*—The following stations of the Marine Telegraph System, established in the Gulf and River St. Lawrence in the interests of navigation and fisheries, are now in operation:—

1. ON CAPE BRETON ISLAND.—(*s*) Flat (Low) point lighthouse, and (*s*) Meat cove, near cape St. Lawrence (landing place of Magdalen island cable).

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2. On Magdalen Island.—(*s*) Bird rocks lighthouse; (*s*) Grosse islet; Wolf islet; House harbour; (*s*) Amherst island lighthouse; Amherst harbour, and Fox bay.

3. On Anticosti Island.—(*s*) Heath point lighthouse; (*s*) South point lighthouse; Jupiter river (Shallop creek); (*s*) South-west point lighthouse; Becscie river; (*s*) West point lighthouse.

4. Chaleur Bay, N. side of entrance.—(*s*) Macquereau point lighthouse.

5. Gaspé Bay.—(*s*) Cape Despair lighthouse; Point St. Peter; Douglas town; Gaspé basin; Peninsula; Grand Grève.

6. St. Lawrence River, south shore.—(*s*) Cape Rozier lighthouse; Griffin cove; Fox river; (*s*) Fame point lighthouse; The Great Pond (Grand Etang); Cholorydorme (about 10 miles north-west of Fame point); Grand Valley (Grande Vallée); Magdalen river; (*s*) Cape Magdalen lighthouse; Mont Louis; (*s*) Martin river lighthouse; Anne point (Ste. Anne des Monts); Cape Chatte village; (*s*) Cape Chatte lighthouse; Les Méchins (near cape Michaux); Ste. Félicité (near Cape Balance); (*s*) Matane lighthouse; (*s*) Little Metis lighthouse; Grand Metis; Ste. Flavie (about 10 miles south-west of Metis point); (*s*) Father point lighthouse; (*s*) Rimouski; (*s*) Rivière du Loup; (*s*) L'Islet.

Note.—The stations in this list marked (*s*) are also signal stations at which the International Code of Signals is used. Additional stations will shortly be opened, of which notice will be given.

Charts, &c., Published by the Hydrographic Department, Admiralty, in November and December, 1881.

No.		*s.*	*d.*
884	Marmara sea :—Artaki bay	1	6
2660*a*.	China :—China sea, southern portion—western sheet	2	6
247	India, west coast :—Jaygad or Jyghur and entrance to Shastri river	1	6
2293	North America, west coast :—Plans in the gulf of California—Sta. Teresa bay. Sta. Maria cove. La Paz harbour. Estero de Agiabampo, entrance. Culiacan river, entrance	1	6

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1059	Australia, south coast :—Doubtful island bay to the head of the Great Australian bight	2	6
458	Africa, east coast :—Mafia island and channels ...	1	6
2866	North America, east coast :—Winyah bay and Georgetown harbour	1	6
457	Japan :—Aburatani harbour	1	0
2761	Plans added. Silaubo Laubo :—South Pajeh island, anchorages.		
21	Plan added. Porvenir bay.		
2533	Plan added. Newhaven harbour.		
1278	Plan added. Iquique road.		

CHARTS THAT HAVE RECEIVED IMPORTANT CORRECTIONS.

No.

1033 Australia, south coast :—Champion bay to cape Naturaliste.
1034 Australia, south coast :—Cape Naturaliste to King George Sound.
655 Africa, east coast :—Almeida bay.
667 Africa, east coast :—Port Melinda.
2456 North America, east coast :—Muskeget channel.
2020 Bay of Fundy :—Campobello island.
1872 North sea :—Calais to the river Schelde.
1440 Mediterranean :—Adriatic sea.
255 Jamaica, south coast :—Morant point to port Royal.
2803 Australia, east coast :—Port Denison.
2489 North America, east coast :—Monomoy harbour.
1772 Ireland, east coast :—Wexford harbour.
2486 North America, east coast :—Plymouth harbour.
727 Fiji islands :—Savu Savu bay.
2562 China :—Canton river.
524 Mediterranean :—Gibraltar new mole.
2806 North America, east coast :—Charleston harbour.
413 Cuba :—Port Mariel.
195 Mediterranean, Malta :—Valetta harbours.
2533 New Zealand :—Otago to Mataura river.
1198 Turkey :—The Bosphorus.

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2580 West Indies :—Cuba, eastern portion.
767 Pacific ocean :—Paumota or Low Archipelago.
1639 Gulf of Mexico :—Louisiana and Texas coasts.
1258 China :—Approaches to Séoul.
2836*a*, *b*. Mediterranean :—Grecian Archipelago (2 sheets).
2844 Gulf of Mexico :—Mobile bay.
2412 China sea :—The islands between Formosa and Japan.
2701 Adriatic sea :—Gulf of Cattaro to Corfu.
2212 China :—Hui-ling-san harbour to Hong Kong.
561 South America, west coast :—Magellan strait to gulf of Peñas.

HYDROGRAPHIC NOTICES RECENTLY PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, 1881-2.

No.

36.—NEWFOUNDLAND PILOT. Relating to Story harbour, Fortune bay.

37.—NEWFOUNDLAND PILOT. Relating to Green banks on south coast of Newfoundland.

38.—WEST INDIA PILOT, Vol. II. Relating to islands in West Indies and to Florida strait.

39.—CHINA SEA DIRECTORY, Vol. III. Relating to the coast of China from San-Moon bay to Yang-tse-Kiang.

40.—GULF OF ADEN PILOT. Relating principally to shoals in gulf of Aden.

41.—PACIFIC OCEAN, SANDWICH ISLANDS. Revised directions for Honolulu harbour.

42.—AUSTRALIA DIRECTORY, Vol. II. Relating to portions of the east coast of Australia and Torres strait.

43.—AFRICA PILOT, Part III. Relating to portions of the east coast of Africa.

44.—RED SEA PILOT. Relating to portions of the coasts of the Red sea.

45.—AUSTRALIA DIRECTORY, Vol. II. Relating to portions of the east coast of Australia and the inner passage to Torres strait.

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46.—MEDITERRANEAN PILOT, Vol. III. Relating to the coasts of Albania and Dalmatia.

47.—MEDITERRANEAN PILOT, Vol. I. Relating to ports in western portion of Mediterranean.

48.—CHINA SEA DIRECTORY, Vol. II. Relating to Paracel islands and reefs, the coast of Cochin-China and Tong King gulf.

BOOKS.

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A NEW METHOD of clearing the Lunar distance	0	3
LIGHT LISTS for 1882.		

OUR OFFICIAL LOG.

OFFICIAL INQUIRIES AT HOME, 1881-2.

1178. *Jane and Hannah*, s.s.; built at Newcastle, 1872; owned by Mr. F. Williams, and another; tonnage, 57; Middlesborough to Kirkcaldy; pig iron; lost off Blyth, October 14, 1881. Inquiry held at Middlesborough, December 8, 1881, before Coleman, Judge; Aplin and Murdoch, N.A. Court found that vessel foundered in a heavy gale of wind.

1179. *S. A. Sadler*, s.s.; built at Middlesborough, 1876; owned by Mr. J. M. Lennard and others,; tonnage, 434; Gefle to Cardiff; deals; lost on Oland Island, September 2, 1881. Inquiry held at Middlesborough, December 9, 1881, before Coleman, Judge; Castle and Beasley, N.A. Master in default in mistaking a light and making no effort to verify his position. Certificate suspended for three months, and recommended for one as mate during that time.

1180. *Princess Royal*, barque; built at Boston. U.S.A., 1858; owned by Mr. J. Hendry; tonnage, 1,200; Quebec to Glasgow; timber; abandoned at sea, November 10, 1881. Inquiry held at

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Greenock, December 15, 1881, before Neill and Ross, Justices; Ward and Wilson, N.A. Vessel waterlogged, abandonment justifiable.

1181. *Hippolyta*, ship; built at Port Glasgow, 1856; owned by Messrs. J. M. and R. R. Heap; tonnage, 853; Rangoon to Liverpool; rice; sustained material damage, about 150 miles S.W. of Fastnet, November 21, 1881. Inquiry held at Liverpool, December 16, 1881, before Raffles, Judge; Hight and Clarke, N.A. Casualty due to stress of weather.

1185. *Annetta*, barque; built at New Brunswick, 1865; owned by Mr. H. Boyd; tonnage, 876; Bowling to Ardrossan; ballast; lost on Horse Island, Ardrossan Harbour, November 22, 1881, when loss of life ensued. Inquiry held at Ardrossan, December 15, 1881, before Alexander and Bailey, Justices; Burney, Murdoch, and Hyde, N.A. Loss due to parting of the towing hawser, and vessel then drifting on the rocks.

1186. *Solway*, s.s., built at Whiteinch, Glasgow, 1881; owned by Mr. W. Sloan and others; tonnage, 413; Glasgow to Bristol; general cargo; took fire at sea, November 16, 1881, when loss of life ensued. Inquiry held at Glasgow, December 15, 1881, before Millar and Scott, Justices; Grant, Forster, and Parish, N.A. Fire occasioned by some casks of petroleum, which were stowed on deck, breaking adrift, and the liquid leaking therefrom taking fire. Master complimented upon his conduct under the trying circumstances.

1188. *Bend Or*, barquentine; built at Appledore, Devon, 1880; owned by Mr. W. Thorburn and others; tonnage, 215; Liverpool to St. John's, Newfoundland; coals; abandoned at sea, October 28, 1881. Inquiry held at Liverpool, December 17, 1881, before Raffles, Judge; Hight and Clarke, N.A. Vessel seriously injured through stress of weather. Master and crew justified in leaving her.

1198. *J. W. Harris*, brigantine; built at Windsor, Nova Scotia, 1859; owned by Mr. S. N. Robinson; tonnage, 172; left Troon with cargo of coals; foundered off Ayr Pier, November, 22, 1881, when several lives were lost. Inquiry held at Ardrossan, December 20, 1881, before Alexander and Bailey, Justices; Burney and

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Murdoch, N.A. Vessel waterlogged and unmanageable through stress of weather.

1194. *Karoon*, barque; built at Green Oak, Nova Scotia, 1878; owned by Mr. A. Smith, of Halifax, N.S.; tonnage, 446; Musquatoboit to Queenstown; deals; abandoned at sea, November, 1881, when two lives were lost. Inquiry held at Westminster, December 20, 1881, before Rothery, Wreck Commissioner; Clarke and Anderson, N.A. Vessel thrown on her beam ends in a gale, and became waterlogged. Abandonment justifiable.

1195. *Ocean Monarch*, brig; built at Guernsey, 1866; owned by Mr. P. Mollet; tonnage, 228; Shields to Plymouth; stranded on the Middle Owers Rock, November 21, 1881. Inquiry held at Westminster, December 20, 1881, before Rothery, Wreck Commissioner; Vaux and Comyn, N.A. Master guilty of negligent navigation in making no allowance for tide and current, and for failing to verify his position. Certificate suspended for six months.

1196. *Flamingo*, s.s.; built at Whiteinch, 1875; owned by Mr. J. White and others; tonnage, 1,209; London to Calcutta; general cargo; stranded in St. Margaret's Bay, near South Foreland, November 16, 1881. Inquiry held at Westminster, December 8, 1881, before Rothery, Wreck Commissioner; Vaux and Hyde, N.A. Casualty due to negligent navigation on the part of the pilot in charge. No blame attached to master.

1197. *Liverpool*, s.s. and *Mary Jane*, keel; the former a ferry boat plying between Hull and New Holland, owned by the Manchester and Sheffield Railway; tonnage, 70; the latter loaded with iron proceeding from Grimsby to Sheffield; tonnage, 70; in collision in the Humber, November 24, 1881, when the keel foundered. Inquiry held at Hull, December 21, 1881, before Twiss, judge; Forster and Harland, N.A. Collision occasioned by the keel carrying no lights and the steamer being unable to see her in time.

1198. *Barbara*, barque; built at Sunderland, 1877; owned by Mr. W. Thomas and others; tonnage, 1,081; Rangoon to Queenstown; rice; lost in Freshwater Bay, Pembroke, November 22, 1881, when loss of life ensued. Inquiry held at Liverpool,

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December 21, 1881; before Raffles, Judge; Hight, Grant and Parish, N.A. Loss due to unskilful navigation; the master was drowned.

1199. *Golden Sea*, ship; built at Quebec, 1864; owned by Mr. R. G. Guy; tonnage, 1,418; Bristol to St. John's; ballast; abandoned at sea October 20, 1881. Inquiry held at Bristol, December 15, 1881; before Rothery, Wreck Commissioner; Harland and Methven, N.A. Loss due to the ballast taken in at Bristol being converted into mud and choking the pumps. Master in default; certificate suspended for three months. Owner also to blame; ordered to pay £100.

1200. *Harefield*, s.s.; built at West Hartlepool, 1871; Mr. E. Cory and others; tonnage 963; Riga to Lynn; linseed; stranded near Filey Brig, December 2, 1881. Inquiry held at Middlesborough, December 22, 1881, before Coleman, Judge; Ward and Curling, N.A. Casualty due to the master having miscalculated his position, Certificate not dealt with.

1201. *Masonic*, ketch; and *Thetford*, s.s.; the former built at Brightlingsea, 1876; owned by Mr. Wm. Dove; tonnage, 117; Antwerp to London; granite; the latter built at Sunderland, 1881; owned by the Standard Steamship Company; tonnage, 866; Riga to London; sleepers; in collision in Sea Reach, whilst the ketch was at anchor, November 23, 1881; one person drowned. Inquiry held at Westminster, December 22, 1881, before Rothery, Wreck Commissioner; White, Castle and Anderson, N.A. Master of *Thetford* in default in allowing his vessel to be too close to the south shore, for not stopping and reversing, and for starboarding his helm when he sighted the *Masonic*. Certificate suspended for three months; recommended for one as mate.

1202. *Naval Reserve*, ship; built at Maine, U.S., 1853; owned by Mr. J. M. Allen; tonnage, 1,831; stranded and lost near Braystones, Cumberland, November 28, 1881. Inquiry held at Liverpool, December 23, 1881, before Raffles, Judge; Wilson and Parish, N.A. Loss due to stress of weather, and master mistaking St. Bees' Head light for that on Douglas Head; his chart having been washed overboard, he was unable to verify his position.

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1203. *British Navy* and *Larnaca*, the former built at Liverpool, 1869; owned by Mr. J. Boumphrey; tonnage, 1,216; London to Sydney; general cargo; the latter built at Liverpool, 1878; owned by Mr. W. B. Sproule; tonnage, 1,434; London to Sydney; general cargo; in collision in the Downs, November 27, 1881, when great loss of life ensued. Inquiry held at Westminster, December 28, 1881, before Rothery, Wreck Commissioner; Grant, Rcnaldson, and Methven, N.A. Casualty due to the cables of the *British Navy* parting during a gale of wind, and that vessel drifting across the bows of the *Larnaca*, injuring herself to such an extent as to cause her to founder within a few minutes. Master's certificate not dealt with.

1203. *Lord Palmerston*, barque; built at Sunderland, 1856; owned by Mr. A. A. Wylie; tonnage, 650; St. John's, N.B., to Queenstown; timber; abandoned at sea, November 20, 1881. Inquiry held at Liverpool, December 24, 1881, before Raffles, Judge; Vaux and Kennedy, N.A. Very heavy weather encountered. Abandonment justifiable.

1207. *Amelia*, s.s.; built at Port Glasgow, 1875; owned by Mr. H. L. Seligmann; tonnage, 379; Dunkirk to Greenock; sugar; lost off Boulogne, December 7, 1881. Inquiry held at Glasgow, December 29, 1881, before McCall and Hamilton, Justices; Grant, Wilson, and Anderson, N.A. Master to blame for not verifying his position by taking the bearings of Cape Grisnez light, and for making insufficient allowance for leeway, &c. Certificate suspended for six months.

1208. *Murton*, s.s.; built at West Hartlepool, 1866; owned by Messrs. Green, Holland and Sons; tonnage, 317; London to Hartlepool; ballast; sustained material damage by the falling in of the crown of the starboard furnace. Inquiry held at Westminster, December 29, 1881, before Rothery, Wreck Commissioner; Beasley, N.A. and Hallett, E.A. Casualty caused by the vessel having been fitted with a water gauge of improper construction, which showed a full glass when the boiler was nearly empty. No blame attached to master or chief engineer.

1211. *Crown*, s.s.; built at Sunderland, 1878; owned by the Crown Shipping Company; tonnage, 534; Tyne to Copenhagen;

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coals; lost off Harboore, coast of Jutland, November 15, 1881. Inquiry held at North Shields, December 23, 1881, before Spence and Jackson, Justices; Curling and Murdoch, N.A. Master in default for steering an improper course, and for neglecting the lead. Certificate suspended for three months.

1212. *W. E. Gladstone*, ship; built at Sunderland, 1865; owned by Mr. G. B. Meager; tonnage, 479; South America to United Kingdom; nitrate of soda; abandoned at sea September 5, 1881. Inquiry held at Swansea, December 31, 1881, before Fowler, Judge; Parfitt and Comyn, N.A. Master and mate both in default for having unnecessarily abandoned the vessel, and for having wilfully scuttled her. Certificates cancelled.

1213. *Britannia*, s.s.; built at Sunderland, 1877; owned by Mr. J. W. Taylor and others; tonnage, 631; Sunderland to Rochester; coals; stranded near Upgang rocks, near Whitby, December 14, 1881. Inquiry held at Middlesborough, January 2, 1882, before Coleman, Judge; Clarke and Harland, N.A. Casualty due to the mate having altered the course. Certificate suspended for six months. Master ordered to pay £20 towards expenses.

1214. *Arica*, brig; built in 1831; owned by Mr. W. Harrison, the master; tonnage, 184; Soderhamn to United Kingdom; deals; lost near St. Mary's Isle, December 13, 1881. Inquiry held at Middlesborough, January 4, 1882, before Coleman, Judge; Clark and Harland, N.A. Loss due to the master neglecting the lead. Reprimanded and fined £10.

1215. *Colleen Bawn*, s.s. and *Eros*, s.s.; the former built at Govan, 1862; owned by the Drogheda Steam Packet Company; tonnage, 319; Drogheda to Liverpool; cargo and passengers; the latter built at Stockton-on-Tees, 1871; owned by Mr. H. Briggs and others; tonnage, 1,155; Glasgow to Alexandria; coals; in collision in Crosby Channel, River Mersey, December 15, 1881; when the *Eros* foundered. Inquiry held at Liverpool, January 5, 1882; before Raffles, Judge; Grant, Parfitt and Methven, N.A. Master of *Colleen Bawn* in default for proceeding at too great a speed in a fog. Certificate suspended for six months.

1216. *Eros*, s.s.; built at Stockton-on-Tees, 1877; owned by

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Mr. H. Briggs and others; tonnage, 1,155; Glasgow to Alexandria; coals; stranded on the South Rock, County Down, December 9, 1881. Inquiry held at Liverpool, January 6, 1882; before Raffles, Judge; Parfitt and Methven, N.A. Stranding due to negligent navigation on the part of master, but as no serious damage ensued his certificate was not dealt with.

1217. *Anne Arbib*, s.s.; built at Kinghorn, 1874; owned by Messrs. Arrib; tonnage, 753; Cronstadt to London; grain; abandoned at sea, November 28, 1881. Inquiry held at Westminster, January 6, 1882, before Rothery, Wreck Commissioner; Forster, Castle and Merrifield, N.A. Loss due to the shifting of the cargo through insufficiency of the shifting-boards. Master in default. Certificate suspended for six months.

1218. *Granite City*, barque; built at Aberdeen, 1853; owned by Mr. R. A. Stewart; tonnage, 726; Dalhousie, N.B. to London; deals; abandoned at sea, November 22, 1881. Inquiry held at Westminster, January 4, 1882, before Rothery, Wreck Commissioner; Beasley and Ronaldson, N.A. Very heavy weather encountered. Abandonment justifiable.

1219. *Ellen*, s.s.; built at Hepburn-on-Tyne, 1872; owned by Mr. E. J. Hough; tonnage, 590; Shields to Copenhagen; coals; lost near Skaw Lighthouse, November 14, 1881. Inquiry held at Westminster, January 7, 1882, before Rothery, Wreck Commissioner; Beasley and Ronaldson, N.A. Loss due to the master estimating bearing and distance of a certain point merely by the sound of the fog-horn, and for neglecting the lead. Certificate suspended for three months, and recommended for one as mate.

1220. *Scio*, brig; built at Hylton, 1839; owned by Mr. J. P. Bushell; tonnage, 265; Newcastle to Copenhagen; coals; after putting back twice into Leith Roads, beached near Kirkcaldy, and became a total wreck. Inquiry held at North Shields before Wait and Hedley, Judges; Forster and Castle, N.A. Loss due to the unseaworthy condition of the brig. Master in default for taking her to sea. Owner also to blame. Ordered to pay £50 towards costs.

1221. *Craigrownie*, s.s.; built at Leith, 1880; owned by Mr. J. Donald and others; tonnage, 575; Bilboa to Troon; iron ore;

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stranded and lost on North Rock, Co. Down, December 13, 1881. Inquiry held at Glasgow, January 6, 1882, before McCulloch and Lecky, Justices; Ward and Parish, N.A. Master and second mate to blame for improper and negligent navigation, and for neglecting to keep a proper look-out. Master's certificate suspended for three months, and second mate's for six months.

1222. *India*, s.s.; built at Dumbarton, 1881; owned by the British India Steam Navigation Company; tonnage, 2,633; London to Calcutta, calling at Madras; general cargo; stranded on the Oaze Sand, near the Gas Buoy, River Thames, November 30, 1881. Inquiry held at Greenwich, January 5, 1882, before Balguy, Judge; Curling and Vaux, N.A. Casualty due to the pilot in charge mistaking the light of a fishing vessel for the East Oaze Gas Buoy.

1223. *Hurworth*, s.s.; built at Sunderland, 1878; owned by Mr. T. H. Davison and others; tonnage, 1,265; Montreal to Rotterdam; grain; abandoned at sea, December 1, 1881. Inquiry held at North Shields, January 6, 1882, before Spence and Spence, Justices; Comyn and Anderson, N.A. Loss due to vessel leaving port with insufficient freeboard and the very severe weather she encountered. Master's certificate not dealt with.

1225. *Helenslea*, barque; *Catalonia*, s.s.; the former built at Dundee, 1880; owned by Mr. W. Stephen; tonnage, 1,196; San Francisco to Queenstown; wheat; the latter built at Clyde Bank, 1881; owned by the Cunard Steamship Company; tonnage, 3,093; Queenstown to New York; cargo and passengers; in collision at the entrance of Cork Harbour, December 25, 1881, when the *Helenslea* foundered and loss of life ensued. Inquiry held at Liverpool, January 12, 1882, before Raffles, Judge; Pickard, Wilson, and Comyn, N.A. Collision due to the *Helenslea* starboarding her helm and crossing the bows of the *Catalonia* too late to avoid a collision, but master committed an error of judgment only in so doing.

Official Inquiries Abroad.

1176. *Highbury*, s.s.; lost on a reef whilst on a voyage from

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Cronstadt to Poti, November 15, 1881. Naval Court held at Copenhagen, December 2, 1881. Loss caused by the wreck of a vessel having been mistaken for the Falsterbo lightship. Master exonerated.

1177. *Lammerlaw*, barque; lost in Shoalwater Bay, October 30, 1881. Naval Court held at Portland, Oregon, November 10, 1881. Master guilty of error of judgment. Censured and warned.

1182. *Hero*, s.s. and *Herga*, s.s.; in collision in Sydney Harbour. Inquiry held at Sydney, September 29, 1881. Both masters to blame. Censured and cautioned to be more careful in future.

1183. *Prince Victor*, barque; abandoned at sea, September 25, 1881. Inquiry held at Newcastle, N.S.W., October 5, 1881. Abandonment justifiable.

1184. *Jessie Spears*, ketch; lost whilst endeavouring to return to Camden Haven. Inquiry held at Sydney, October 8, 1881. No blame attached to master.

1187. *Africa*, s.s.; stranded on Cotta Reef, October 1, 1881. Inquiry held at Calicut, November 2, 1881. Second mate to blame for negligence and disobedience of orders. Certificate cancelled.

1189. *Geraldine Paget*, ship; lost on Pratas Shoal, October 14, 1881. Inquiry held at Hong Kong, October 24, 1881. No blame attached to master.

1190. *Emily*, brig; lost in Tientsin Harbour. Naval Court held at Tientsin, October 11, 1881. Loss due to the vessel striking an anchor or some such obstacle. Master free from blame.

1191. *Compton*, s.s., stranded on three occasions whilst on a voyage from Riga. Naval Court held at Copenhagen, December 2, 1881. First and second mates censured. Master's certificate suspended for three months.

1192. *Arctic*, lost on Squan Beach, New Jersey, September 23, 1881. Naval Court held at New York, November 29, 1881. Master exonerated from blame.

1204. *Pakhoi*, s.s.; stranded on Brown Rock, Amoy, November 5, 1881. Naval Court held at Amoy, November 11,

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1881. Accident due to the Brown Rock buoy being in a false position.

1205. *Edith Lorn*, ship; lost in the Middle Sands, Columbia River, November 17, 1881. Naval Court held at Portland, Oregon, November 23, 1881. Ship in charge of pilot at time of loss. Master free from blame.

1206. *G. Broughton*, barque; lost near Lead-bitter Point, Shoalwater Bay. Naval Court held at Portland Oregon, November 17, 1881. No blame attached to master.

1209. *Rhondda*, s.s., and *Alsace Lorraine*, s.s.; in collision in Faro Straits, November 30, 1881, when the French steamer foundered. Inquiry held at Malta, December 20, 1881. Collision due to the strength of the current which prevented the *Rhondda* answering her helm, and to the French vessel being on the wrong side of the channel.

1224. *Ark*, ketch; foundered at sea. Inquiry held at Port Adelaide, November 22, 1881. Casualty due to carrying away the rudder head. Master free from blame.

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THE

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MERCHANT SHIPPING COUNCIL.

THE Board of Trade have issued for the consideration of the shipping interest a circular (which follows these observations), in which the President invites that interest to go hand in hand with him in establishing a high-class Council or tribunal, having power to settle disputes arising between the Board's officers and the shipowners and their servants; to frame rules on which the Board's officers shall act in determining the load-line of ships and the thousand and one questions continually arising; and last but not least, which shall to a certain extent administer the Merchant Shipping Acts in certain cases, concurrently, but not altogether conjointly, with the Board of Trade officers, whilst their advice shall be available to guide the administration in all cases. The proposal contains the germs of the first step towards the establishment of a consultative and administrative department of Mercantile Marine outside of the Board of Trade, a department which whilst it shall lay down rules, and practically administer them, shall be also a Court of Appeal.

At the present time the Board of Trade administer the Merchant Shipping Acts subject to questions in Parliament, subject to appeals to "Courts of Survey" and to "scientific referees,"

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and subject also to supervision by the ordinary juries, the most unfit tribunal that could be devised for such cases. No one can fail to sympathise with the President of the Board of Trade under these circumstances, nor to commiserate with the Board's staff, who do their duties subject to such drawbacks, when added to them are included some fearful and wonderful decisions of Wreck Inquiry Courts on the subject of overloading and unseaworthiness.

The circular now issued makes it evident that the dissatisfaction of the Board of Trade with its present duties and responsibilities is great, and its faith in the Courts of Appeal infinitesimal; and the desire of the Board, in making proposals for a change seems from the whole tenour of the circular to be exactly the desire of the shipowner; that is to say, to get a competent body to give sound advice and to try questionable cases and points.

Under the proposed scheme it would appear therefore that the new Council is (for instance) to deal with questions of freeboard, of the strength of boilers, of the area of safety valves, of the ventilation of coal laden ships, of the stowage of gunpowder, of the carriage of cattle, &c., &c., and is generally to supervise the application of any rules and principles they may frame, and in any special case in which any question arises on their rules and principles, to superintend and settle their application to the case in dispute; and the settlement is to be conclusive as far as possible in every court of law. The members of the Council will probably have to attend at an office in London, and will probably be fully occupied, if indeed they will not need the assistance of a staff of clerks, surveyors, and other experts.

As regards the load-line, it is high time that something should be done, and done in no hesitating manner. We venture to assume that there are very few respectable shipowners who will deny that there are still many ships and lives lost by overloading. It matters not, however, whether shipowners do or do not deny it, for the fact remains. Now this overloading may be intentional or it may be in ignorance, but in either case it is deemed to be profitable to those who invest money in it, while it is hazardous to those who happen to man ships in which it is practised: and both ignorance

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and intention require a strong supervising body to control them.

It is not so much, however, in cases of absolute overloading that final and positive, but well thought out rules are necessary—where they are most necessary is to protect the honest and good shipowner from the effects of "fads" and "crotchets" whether nurtured by mistaken philanthrophists or ridden in high places. He is at the present moment liable to be tumbled to the ground, and perhaps get a bad fall between "two stools," one labelled "spare buoyancy," and the other "co-efficient of fineness." As an example of the extreme uncertainty to a shipowner, we may take a well known case investigated some time since in which the Court found that the ship was overloaded. The Court believed in "Martell's Tables," though neither the owner, nor Lloyd's Register, nor as far as we know, any body else has accepted them.

If instead of Martell's Tables, which Lloyd's Register will not stamp with their authority, some other tables were to be issued with their official imprimatur, the matter of the load-line would be simplified, if indeed it would not, as we have often urged before, be settled. So long as those bodies who have the knowledge and power to speak authoritatively will not do so, and so long as no agreement is come to between the classification societies and the shipowners on the load-line and one or two other questions, it does appear to us that Mr. Chamberlain will be supported by the whole sense of the country when he insists that some council, or body, or department (old or new is immaterial), must be empowered and required, and with a high hand, and if necessary absolutely without appeal, to make and enforce rules. We had much rather see all this done by the machinery of existing institutions and acquiescence of shipowners and underwriters without friction, leaving the Board of Trade a wholly independent and general and responsible supervision, as at present. But as those interests and institutions who ought to have moved long ago, will not move now, they must not be surprised, and they will have no right to object, if they wake up some day and find that they have lost their status and that the legislature will settle the matter for them.

The constitution and workability of the proposed Council is

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being discussed throughout the country at the present moment, and we wait the result with no little curiosity. In the meantime, although we do not think the Board of Trade scheme is sufficiently matured to be workable, indeed it seems only to be thrown out as a crude suggestion, it is valuable as indicating what is in the mind of its President; that is to say, it may be seen that the right hon. gentleman does not intend to sit still and do nothing simply because shipowners and classification societies continue to cry *non possumus* whenever they are asked to come to some understanding as regards the application of a load-line scheme, and also that he does not mean to endure a state of things in which the lives of the seamen may be endangered by juries of cockney tradesmen, or out-of-the-way Courts of Survey, or decisions of wreck inquiry Courts which are in some cases palpably absurd, dealing with important technical cases which ought to be dealt with, and can only be rightly understood and rightly dealt with by competent persons of high standing in their avocations; gentlemen such as those we may hope will, if it is ever formed, be found as the members, and officers of the technical staff, of the new Council. For the present we have no further observations to make on Mr. Chamberlain's sensible and praiseworthy effort to enlist on the side of humanity and justice the best of the shipowners in the Mercantile Marine. We merely now put forward two or three points for consideration.

The first is, who is the shipowner that is to be represented in the Council. This is an important point. The shipowner of old has almost disappeared, and in his place, and apart from the large companies, we find that persons are entered as managing owners, or persons entrusted with the management of ships, from a single ship to perhaps twenty ships, who are not interested in the ships beyond the percentage they manage to get on incomings and outgoings. It is possibly not to the interest of such persons that the lives of the crew should outweigh a few inches less of freeboard. That sort of so-called "shipowner" needs no representation, and therefore it must be made quite clear that it is the holders of shares in ships, and not the managers of ships belonging to other people, who should be electors in the new constituency. The second point is how

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far the new proposal is to form a new Marine Department outside the Board of Trade. If it means this, it needs most careful consideration. One thing is quite clear, viz., that the merchant shipping of this country must not be harrassed by dual Government. Therefore, in the end, the new Council must, if it is to have administrative functions, either become a dummy in the hands of the Board of Trade, or the Marine Department must become a nonentity in the hands of the Council, and be used by the Council to register and execute its decrees without question.

The third point is whether, as the experiment is new, it would not be better at first to confine the duties of the Council to the giving of advice. To heap too much on it at first may be to break it down altogether. And there is this awkwardness in making the same body a framer of rules, an administrator of them, an executor of them, and a judge in disputed cases under them—that it makes the same body perform functions that to be efficiently performed cannot be performed by the same persons; and further we venture to suggest whether the making of the members of so distinguished a body into executive officers, would not be to debase the gentlemen who may be elected as members. It will be a high and proud position to be an adviser of the Government in matters connected with the Mercantile Marine, to study preambles, and frame laws and rules, and to sit in judgment between officers of the State and the shipowners; but it is not a high function, nor is it a dignified or necessary thing, for the members of the proposed Great Central Council to be expected to hurry off in the night to see a screw collier that is detained, and to enter into the executive work on the spot. We believe that many shipowners, shipbuilders, engineers, sailors, underwriters, and merchants, would find it consistent with their dignity to meet in offices in London and receive salaries for preparing the important work of giving advice to the President of the Board of Trade on grave subjects and principles; but we do not believe it is necessary (in fact, it seems to us, that the very object for which the Council is proposed would be defeated thereby) for the members to be expected to convert themselves into travelling inspectors; and, further, if the

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members or staff of the new Council became executive officers, or even administrative officers, a question will arise as to their responsibility to Parliament through some political chief or Minister of State—as it is not to be expected that the shipowners' property is to be dealt with by persons having no responsibility to Parliament. This question would not, of course, arise, so long as the Council is advising and consultative.

PROPOSAL FOR THE ESTABLISHMENT OF A MERCHANT SHIPPING COUNCIL.

The legislation concerning the safety of Merchant Ships requires careful consideration, and it is desirable that it should be reconsidered at a time when there is no exceptional demand for legislation.

The power of stopping unsafe ships vested in the Board of Trade and its officers has been largely and usefully exercised, but it is open to great and increasing objections, and the power of prosecuting for sending a ship to sea in an unseaworthy condition may be said to have broken down altogether. The reasons for these conclusions are as follows:—

1. The discretion vested in the officers of the Board of Trade is too large. Many endeavours have been made to limit it by fixed rules and principles, but in vain. One of the most promising endeavours, viz., the appointment of a Committee to consider what principles should govern the action of the Board of Trade in dealing with overloading—a Committee which consisted of representatives of the Board of Trade, of Lloyd's, and of the Liverpool Underwriters' Association—broke down because the members found themselves unable to agree about the essential elements of the question they were to discuss.
2. When a ship is stopped, or when the owner is apprehensive that his ship will be stopped, he not unnaturally applies to the Board of Trade to give him a load-line, or otherwise specify what it is that the Board require. This the Board of Trade have hitherto refused to do, because it is not their business to fix a load-line or otherwise instruct shipowners

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as to their business, but only to interfere when the law is broken. But their position is not very tenable.

3. There is no rule, no scientific principles, which can be invoked to determine whether any given ship is or is not unseaworthy. Nor is practical experience unanimous. The best experts differ, not only as to principles, but as to each particular case. Consequently, when the Board of Trade have to stop a ship, still more when they have to prosecute, they are in the utmost difficulty. Their own advisers may not agree, or if they do agree with one another, they may not agree with the Assessors or the Wreck Commissioner.

4. The ultimate appeal, whether in the form of a prosecution for sending an unseaworthy ship to sea, or in an action for damages against the Board of Trade for stopping a ship, is to a judge and jury,—the former probably ignorant of nautical matters, the latter still more ignorant, and, possibly, prejudiced. But with the best possible tribunal, the Board of Trade, representing the public, are at a great disadvantage. When a case can be put as one of discretion or opinion, and not of scientific certainty or of unvarying practice, it is difficult to justify detention, and scarcely possible to get a conviction. Where detention has been possible, the fact that the ship has not been detained is held to be evidence excusing the shipowner; and where there is doubt as to unseaworthiness (and few cases are free from doubt), judges and juries are apt to hold that detention, even for purposes of inquiry, is a wrong to the shipowner.

5. In the case of overloading, the voluntary load-line makes matters worse. It probably deceives people who believe it to have some legal sanction, and the shipowner whose ship is stopped for overloading says with some force, "You have seen what I meant to do and have allowed me to go on, and now, at the last moment, when it is in the highest degree inconvenient, you prevent me from going to sea."

It should be borne in mind that the present practice of the

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Board of Trade differs widely from what was contemplated when the power to stop an unseaworthy ship was first introduced. The intention then was to have a very few thoroughly experienced officers, who might be sent first to one port and then to another, as occasion might require, to detect and deal with the worst cases by way of example. After the agitation of 1872 and the following years, a large staff of officers was created, occupying, or supposed to occupy, the whole of the coasts. Although they are not and cannot be ubiquitous or sufficiently numerous to attend to all ships, they are assumed by the Courts to be so; if a bad ship gets to sea the shipowner escapes responsibility, because, as the judges say, she ought to have been stopped by the Board of Trade, whilst if the Board's officers do stop a ship about which there is the least doubt, even for purposes of inquiry, the same judges and juries will very probably hold the Government liable in heavy damages.

The present practice, therefore, cannot stand without alteration. It is vexatious to the shipowner, or it fails to make him responsible, and it throws upon the Board of Trade a responsibility which that department cannot discharge satisfactorily.

What appears to be needed is some authority which shall be competent to settle disputed questions of unseaworthiness in such a way as to be satisfactory both to the shipowner and the public.

39 & 40 *Vict.*, *c.* 80, *ss.* 6, 7, 14.—Since 1876 there has been an appeal from the Board of Trade and its officers when they detain a ship for unseaworthiness, or when they refuse a certificate to a passenger or emigrant ship. This appeal lies to a Court of Survey, which consists practically of the Wreck Commissioner, aided by two Assessors, one appointed by the Board of Trade, the other selected by the Registrar of the Court, or by the Wreck Commissioner, from a list named by the Local Marine Board, or other shipowning body of the port, or in the absence of such list nominated by the Wreck Commissioner.

Sec. 15.—In addition, there is a power to refer difficult questions to scientific referees appointed by the Home Secretary, but this power has never been exercised.

Appeals in the above cases necessarily assume a judicial character. They decide the particular dispute, and may in that way

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make precedents, but they do not provide general rules or principles to guide practice. They are also expensive, and therefore oppressive. Nor is the constitution of the Court such as to command general acquiescence, especially in cases where the decision must be taken as a precedent guiding the practice for the future. For this purpose the shipping interest have a right to require something more representative.

What is needed in the way of appeal or superior authority appears to be twofold; viz:

First. Some authority competent to investigate doubtful questions of general practice, and to lay down principles and general rules.

Secondly. A Court or authority competent to apply rules to individual cases.

Constitution of Board.—Any body which can do this must possess the confidence both of the shipowners and the public. It must not be purely official, working in the dark, and reflecting the views of the Minister for the time being or his subordinates; it must not be purely representative of the trade, or it will not do, or be thought to do, justice to seamen and passengers. Under these circumstances the following are outlines of a scheme for the construction of a Board possessing the necessary qualifications.

Shipping Council.

(1.) A Council consisting of a chairman and 18 members, to be appointed as follows:

(*a.*) President and three members by the Board of Trade.

(*b.*) Two members by Lloyd's Registry.

(*c.*) One member by the Liverpool Underwriters' Association.

(*d.*) Seven members by the shipping interest, viz., one for each of the following districts—

London and South Coast.
Bristol and Channel.
Liverpool and West Coast.
Hull and East Coast.
North-east Coast.
Scotland.
Ireland.

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(*e.*) The electors in each district to be the owners of ships registered in the district with a plurality of votes; each owner to have one vote for every 100 tons of shipping owned by him.

(*f.*) The members to retire in rotation, and to be paid for attendance.

(*g.*) Council to have powers of inspectors of Board of Trade of administering oaths and inspecting ships.

(2.) The duties of the Council shall be twofold, viz.:

(*a.*) They shall act as advisers to the Board of Trade in the administration of the Merchant Shipping Acts.

(*b.*) They shall constitute a Court of Appeal in case of any question between the officers of the Board of Trade and any shipowner which arises under those Acts.

(3.) If any question arises under the said Acts on which the Board of Trade desire to have the opinion of the Council, the Board may refer such case for their opinion, and shall act upon that opinion when given.

(4.) Where a ship has been provisionally detained under the Merchant Shipping Act, 1876, and the shipowner refuses to comply with the requirements of the Board of Trade or its officers, the Board shall refer the question to the Council, and their decision shall be final. This is to be in lieu of the appeal to the Court of Survey provided by the Merchant Shipping Act, 1876.

M. S. Act, 1854, *ss.* 303, 309, 312. 25 *& 26 Vict.*, *c.* 63, *ss.* 11, 50. *M. S. Act*, 1862, *s.* 30.—(5.) Whenever any dispute arises between a shipowner and an officer of the Board of Trade concerning a declaration for a passenger steamer, or concerning a certificate of clearance for an emigrant ship, or concerning a certificate with respect to lights and fog-signals, the Board of Trade shall refer the question to the Council, and their decision shall be final. This is to be in lieu of the appeal to the Court of Survey under s. 14 of the Merchant Shipping Act, 1876.

(6.) Where in the exercise of powers given to them by the above-mentioned Acts the Board of Trade find it necessary to issue instructions to their officers as to the means to be taken for the security of ships carrying gunpowder, coal, iron, ores, cattle, &c.,

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they may consult the Council in framing them, and may refer questions upon them to the Council, and if any dispute arises under them the Board of Trade may refer the case to the Council, and their decision shall be final. . This is to be in lieu of the appeal to the Court of Survey under s. 14 of the Merchant Shipping Act, 1876.

(7.) Where any question requires immediate local action, it may be referred to a sub-committee consisting of the member of the Council for the district and one of the members appointed by the Board of Trade. Their decision may be acted on in the particular case, but must be reported to the next meeting of the Council for approval before being generally adopted.

(8.) The Board of Trade may at any time submit any matter to the Council for reconsideration.

(9.) In matters referred to the Council, the decision of the Council shall be final, and shall be made, as far as possible, conclusive in every court of law.

Load-Line.

One of the most important subjects with which the Council would have to deal is Load-Line. It is suggested that this may be done as follows, viz. :—

(10.) (*a.*) A load-line to be permanently marked on every ship and entered in her certificate of registry.

(*b.*) A ship sailing from or to the United Kingdom without a load-line or with the load-line immersed will be subject to detention and to heavy penalties.

(*c.*) A statement to be sent to an officer of the Board of Trade of the intended load-line, with the plans, sections, and particulars required from time to time by the Board of Trade with a view to enabling the propriety of the load-line to be determined.

(*d.*) If the officer of the Board of Trade agrees to the proposed load-line that will be the load-line.

(*e.*) If the officer does not agree the shipowner may appeal to the Council.

(*f.*) The Board of Trade may refer any proposed load-line to the Council, whose decision shall be final.

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(*g.*) The load-line statement to be sent, in the case of new ships, before registration, in the case of existing ships, within a certain period, and with such modifications as may be necessary.

(*h.*) The Board of Trade may refer to the Council the question of making rules as to load-lines.

The above suggestions are submitted for the consideration of those persons who are interested in this question. It will be understood that they are only outlines of a scheme suggested to meet a pressing want, and that they are open to any criticisms and alterations which the experience of such persons can supply. Such criticisms are accordingly invited by the Board of Trade. If it appears that the main features of the scheme meet with general concurrence, it will be easy to embody it in a Bill, with such modifications as may, in the course of discussion, appear to be desirable.

Board of Trade,

January, 1882.

FAIR TRADE.

THERE can be no question that a considerable deal of ingenuity is being expended in this country in the attempt to bring about a revival of certain economical principles which are commonly supposed to be extinct, so far as our commercial policy is concerned. Only a few years since we imagined these doctrines had for ever disappeared; but recent events show that they were merely in a state of quiescence. Under the influence of the trade depression through which the country has lately passed they have again come to the front; and, although their advocates were at first somewhat diffident in proclaiming their advantages, this hesitation gradually wore away, and they have now assumed a more or less clearly defined character. In this latter respect, however, even their present condition leaves much to be desired. Perhaps no better

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evidence of the hold which Free Trade principles have taken among us could be adduced, than is to be found in the emphatic protestations of most of those who suggest a reversal of the policy adopted by England during the last forty years. They maintain that they do not for one moment believe in the superior utility of Protection as compared with Free Trade. On the contrary, they claim to be unswerving supporters of the latter—more so indeed than the orthodox believers in that system—since what they desire to secure is not partial, but thorough-going Free Trade between all nations. In short, the very name of Fair Traders which they have adopted bears evidence of the purity and disinterestedness of their views. In their opinion it is no longer sufficient to extol the advantages of freedom under any circumstances. The world refuses to listen to us. We must, therefore, adopt a new policy and see whether, by means of Fair Trade, we cannot convert to our own views the stubborn communities by which we are surrounded.

In connection with this new scheme for gaining proselytes, the Fair Traders have a grand moral conception in view. They propose, at one stroke, not merely to instil new life into the flagging sinews of England's commercial system, but also to unite the whole British Empire into one grand Confederation. By means of duties, judiciously imposed, this Union is to be made entirely self-supporting. It is, moreover, to take up the running at the point where the old country is supposed to be hopelessly beaten, and is to attain a degree of prosperity that will astonish the whole civilised world. Only the rough outline of this proposal has thus far been sketched. The details for its accomplishment have yet to be filled in. With regard to this phase of the subject we would venture to suggest that, if any practical results are to ensue, it is high time for some of the Fair Traders to preach the new doctrine in the Colonies. To say the least of it England is at present being treated with anything but filial gratitude by her colonial dependencies, for the latter are rapidly hedging themselves round with tariffs even more protective than those which foreign nations are adopting.

It may be questioned whether, as a matter of fact, any Fair

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Trader really believes in the feasibility of uniting the whole British Empire into a single Confederation. Such an object may possess certain moral attractions, but no man who has considered the subject can be blind to the fact that in the question of commercial tariffs it is of little use to appeal to sentimental considerations. If our Colonial Office were to send a circular despatch to each colony which has adopted a protective tariff, and suggest its abrogation in favour of English manufactures, the replies would certainly contain inquiries as to the advantages which England proposed to offer in return. They would differ in no essential respect from the replies that would be sent to similar inquiries from France, or Germany, or Russia. Among the causes which have induced our colonies to adopt protective tariffs, first and foremost must be placed the desire to encourage their own manufacturing industries; and to some extent this object has, no doubt, been attained. Those who believe in the possibility of establishing a British Customs Union must, therefore, assume that the colonists are prepared to see these forced industries destroyed by English competition in return for the small advantage which we could offer in the shape of a duty on certain articles of food.

But the simple truth is that this ideal scheme for a grand British Confederation—apart from the question of its practicability—serves only to conceal the real point at issue. We presume that no man, whether he calls himself Free Trader, Fair Trader, or Protectionist, will dispute that the primary object of any commercial system should be that of supporting and increasing the national prosperity. And, if this assumption be granted, it necessarily follows that the proposal to include the colonies with the mother country simply widens the boundaries of the problem, but does not in the least affect its solution. Whether we regard only the United Kingdom, or the United Kingdom and all its dependencies, the economical question at stake remains the same. And it is on economical grounds that it must be considered. It may suit the purpose of those who describe themselves as Fair Traders to drag Imperial considerations into the dispute, but these have no connection whatever with the subject. The new school of economists must be content to argue the question solely on the ground

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of the utility of Customs' duties as a means of contributing to the general welfare; for whether the British Empire be assumed to consist of the British Isles only, or of the British Isles and all the British colonies, it is on this question that the problem really turns.

The matter is really a very simple one; but, at the same time, it must be confessed that the extent to which it has been made to wear a complicated look reflects considerable credit on the ingenuity of its latest exponents. We are told that England "so long magnanimous and forbearing stands at last like a lion at bay" before the hostile tariffs of the world. The metaphor is a forcible one, but we are not inclined to quibble over its suitability. We shall proceed briefly to examine the mode in which our unfortunate country is to be delivered from her perilous position. We cannot dispute the fact that each succeeding year seems to add to the number of the artificial barriers raised against English enterprise. And for the sake of argument we will assume that these have been increased to the utmost possible, or even conceivable, limit. We will suppose too that our colonies, in return for the small advantage we could offer them in the shape of a duty of four or five shillings per quarter on foreign corn—the amount of the proposed duty on American beef and bacon has, we believe, not yet been fixed—would consent to see the few manufacturing industries they have succeeded in fanning into artificial existence annihilated by English competition. We will take it for granted, moreover, that our countrymen, for Imperial considerations, would be willing to tax themselves by paying an increased price for bread. On this point the Fair Trader, like the servant girl who pleaded as an excuse for her indiscretion, that her child was but a very small one, urges that the increase would be only trifling, since wheat can be grown more advantageously in Canada than in the United States. Seated by his fireside he knows where crops can be raised cheaply, better than the men who are searching every corner of the earth actuated by the sole desire to gain their living by cultivating the soil. However, we will allow these matters to pass, and assume that the Customs' Confederation has been established, and that all the outside markets are closed against us by hostile tariffs. The

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spectacle of this grand Confederation "at bay," would perhaps be more imposing than that of the ordinary British lion in a similar predicament, but in all essential respects the situation would be the same. Now let us note the manner in which the Fair Trader would come to the rescue. He would simply advise the Confederation to remain in its uncomfortable position. He would merely say, "since the outside world declines to allow your wares to enter its markets except on disadvantageous terms you may easily counteract this evil by refusing all commercial communication with it. You are self-supporting, and can manage to exist without any foreign assistance. The people of England may be paying more for their bread than is absolutely necessary, but they have at least the satisfaction of knowing that by doing so they are aiding the development of Canadian and Australian agriculture. And if there are any manufactured articles with which foreigners could supply the colonists at a cheaper rate than that at which they could be supplied from England, the proper course for the colonists to adopt is to decline them in favour of English goods. By so doing they will have the satisfaction of knowing that they are taxing themselves for the benefit of England, in order that England may tax herself for their benefit in return." In short, the Confederation would be nothing more nor less than a Mutual Taxing Benefit Association.

The foregoing is a fair illustration of the difficulties for which the Fair Trade principles are supposed to provide a remedy. For if those principles mean anything, they must necessarily imply that the general prosperity of the British Confederation would be aided more by restricting communication with the outside world than by leaving it unfettered. The effect of protective duties must be a rise in prices, and when they cease to have this result the necessity for their existence is gone. But no Fair Trader has yet explained how a rise in prices can result in a net gain to a community, and we venture to assert that no man will ever succeed in doing so. The problem simply resolves itself into the question whether isolation is preferable to free, or even to partial, intercourse. The great fallacy which underlies all Protectionist theories consists in the supposition that there is a kind of magic

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influence in the boundaries of States. Their advocates forget that whether the subject be considered with reference to the interests of a single village, of a county, of a State, or of a great Confederation, the question remains the same. They also commit the error of assuming that Free Traders claim a magic power for their system as a countervailing agency, even against the direct influence of hostile tariffs. But this is precisely what is not claimed. If all the markets of the world were closed against us, and if every nation decided to adopt a policy of commercial isolation, our commercial supremacy would certainly be lost. But what Free Traders maintain is that the imposition of import duties would not contribute one jot towards its recovery. With a general "beggar my neighbour" policy the whole world over, the supremacy would rest with the nation which possessed the greatest range of natural resources, and that nation would certainly not be England. No doubt the Fair Traders who have projected the British Confederation are, to some extent, conscious of this fact, and have framed their scheme accordingly. But what they have not explained to us is the manner in which the Canadians, for example, would eventually be induced to tax themselves for our benefit. The first result of a universal policy of isolation would be the loss of something like 50 per cent. of our export trade. (In his recent pamphlet on *Free Trade versus Fair Trade*, Mr. Farrer gives the following percentages as the relative proportions of the total English export trade for 1880, viz.:—Colonies, 20; India, 13½; and Foreign Countries, 66½ per cent.) However, we will assume the loss to be 50 per cent., and that the resources of our colonies have been further developed by the transfer to them of an additional 17 per cent. of our present trade. Now, side by side with the Canadians there is a Confederation which, like the supposed British Confederation, possesses all the qualifications essential for commercial enterprise, but with this additional advantage. Its resources are compact and concentrated, whilst those of its neighbours would be divided by the Atlantic Ocean. And when it came to pass, as it certainly would do under this new order of things, that the United States' manufacturers offered the Canadians goods at prices much lower than those of English goods, how would

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Canada be retained within the Union? On this point the Fair Traders give us no information. It is a difficulty for which they have altogether failed to provide.

Of course the condition of affairs we have here supposed is at present far from being realized and, as far as it is possible to judge, it never will be realized. For generations yet to come there will be free and open markets and, so long as England keeps her hands unfettered, it is in these that she will be able to occupy the first place. It is by supplying the world at large with manufactured goods that she has gained her commercial supremacy, yet now the Fair Traders suggest that she should turn her attention from foreign markets and devote it exclusively to the development of her colonial resources. Fifty per cent. of her entire trade is to be treated as matter of no moment, and all the national efforts are to be directed to the operation of welding into a grand Customs Confederation a number of States between which at the present time there is not the smallest trace of cohesion. It would seem that Fair Traders never pause to consider the sources from which England has derived her prosperity or to examine the circumstances which have contributed to its growth. They apparently forget that the advantages she possesses in the shape of great physical resources, a first-class geographical position, and a spirit of enterprise in her people, have been brought into play chiefly by means of commercial intercourse with foreign nations. And, this being the case, it is beyond our power to imagine how the national prosperity can be increased by placing artificial checks on the foreign trade. That England has gained her great wealth by supplying the world generally with manufactured goods and by acting as its principal carrier is clear. Yet, if the proposals of the Fair Traders have any economical meaning, we have now reached a point at which an entirely new order of things is to commence, and by some process which has not yet been explained, the prosperity of the country is to be increased by dispensing with a portion of our foreign trade, and by diverting a portion of the national capital from its present forms of employment and bringing it to bear upon industries which are to be stimulated into artificial life by means of protective duties.

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Of the utility of protection as a means of retaliation it is unnecessary to speak at any length. We presume that, if the term retaliation has any definite meaning in the Fair Trader's vocabulary, it signifies a mode of regaining the *real* Free Trade which these economists profess to love so well, and not merely a species of commercial retribution. But, in the first place, it must be remarked that, unless raw material and articles of food are to be taxed, there is very little except French silk goods upon which duties could be levied. If the time should come when our home markets could be supplied by foreign manufacturers more advantageously than by our own, then the opportunity for utilizing the sovereign remedy of the Fair Traders would have arrived. The lever which is to be used in forcing open foreign markets could then be produced ; but unfortunately the necessity for its use would, by that time, have vanished. The markets of the countries which could supply us more cheaply than we could supply ourselves would be quite open to us—too much so indeed—while in neutral markets we should then be altogether out of the race. If there be any virtue in protective duties as a weapon of offence we would venture to ask Fair Traders to explain in what manner our neighbours across the channel are to derive any advantage of this kind from them. If the cotton manufacturer of Rouen, for example, finds himself undersold in his own country by Manchester, how is he, by means of a duty that will raise the price of cotton goods in France, to force his wares into the English markets? For ourselves we must give this question up. When Fair Traders have found the answer, we shall be able to understand how the English manufacturer is to regain his footing in lost markets, or to establish it in new ones, by the aid of duties which, if they have the effect they are intended to have, must add an artificial item to the price of his goods. It only remains then to be considered whether it is advisable to impose duties at every favourable opportunity, simply with a view to provide for the chance of being able to hold out the promise of their removal as an inducement to foreigners to grant similar concessions in our favour—or in other words, whether we are to give an artificial

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existence to certain industries in order that we may afterwards conclude Commercial Treaties in which we should consent to their destruction on the condition that a like course would be adopted with regard to some branch of foreign manufacture. We will allow that the inherent and radical disadvantages of protection to which we have already referred do not directly bear on this phase of the question, and that, if protective duties could be made to result in a nett advantage in the manner here indicated, they might be classed as necessary evils. But, in addition to the drawbacks already mentioned, there are others not less important. In the first place, if we are to commence bolstering up decaying industries or reviving those which are practically dead, who is to decide at what point this policy is to end? If the country is to tax itself for one section of the community, why should it not do so for another? And, when some flagging trades have been forced into new life, will those whose interests are embarked in them, submit to their destruction by foreign competition without an obstinate struggle? For example, we will suppose that the English silk and glove trades, by the aid of high protective duties had attained double or treble their present proportions, and that the British Government wished to obtain an entry to French markets for English cloth and boots. It is evident that the difficulties in the way of exchanging concessions in these cases would be well nigh insurmountable. The hundreds of thousands of persons engaged in the silk and glove manufactures would see themselves threatened with ruin, and the opposition they would offer, together with the popular sympathy their position would arouse, would render it impossible for any administration to sacrifice them to the interests of other trades. Fair Traders appear to imagine that protective duties can be imposed or removed by a stroke of the pen without causing the least unpleasant disturbance; but, the fact is, their manipulation is almost invariably attended by a deal of fierce commotion, and, when large interests are at stake, their suppression becomes a matter of the utmost difficulty. Quite apart from any question as to the economical soundness of the protective system, these considerations make it desirable that the country should hesitate

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before taking even the semblance of a step on the slippery paths of what is now pleasantly termed Fair Trade.

It is unfortunate that this question has become to some extent mixed up with party politics. In reality it is no more a matter for party disputes than is the Law of Storms. It is a simple question of fact about which there is not much room for misapprehension. Indeed an apology for referring to the subject would be necessary were it not that certain fallacies which, in this country, were practically demolished some forty years since, are again making their appearance, decked out in a partially new guise. We have little fear that they will make any real progress, but at the same time it may be well to keep a watch on each phase of their development. The latest proposal we have seen is that the duties on tea, coffee, and tobacco, should be reduced and the revenue compensated by a corresponding increase in the duties on wine, silk, and gloves. In this way a portion of the burden of taxation would, it is said, be shifted from the poor to the rich. The object of this suggestion like the scheme for a British Confederation is intended to be regarded as a lofty one, but its real character is too apparent to require any discussion. It is interesting to notice the facility with which Protectionists shift their ground, although it is somewhat difficult to follow them in the mazy wanderings of their arguments and suggestions. They admit the economical inutility of protective duties, but in the same breath they point to the fact that most nations have adopted a contrary view, and ask whether they are all mistaken and only England is right. They allow that England has flourished under Free Trade, but they ask why the United States have also flourished under a system of extreme protection. They wish to form a Grand Confederation, and at the same time to place a tax on the poor man's loaf for Imperial reasons; and now they come forward as the poor man's friends and deliverers. The more cautious among them merely suggest inquiry in order that we may make quite certain we are on the right track. They will admit no doubt openly, but they would like to be fully assured as to the soundness of our position.

We are not inclined to be alarmists with regard to England's

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future, but we feel convinced that the first step taken back towards the protective system will be clear evidence that her commercial supremacy is on the wane. Her greatest struggle is yet to come. The only competitor she has to fear is at present bound hand and foot by tariffs, and as long as these fetters are retained we have no serious cause for alarm. As yet the commercial world is practically our own. The real competition will begin when these obstacles are removed, and if it then comes to pass that England finds it advisable to hoist the Fair Trade colours, the future historian of her decline may at once commence his task. The material for his work will then be at hand.

OUR SEAMARKS—VIII.

LIGHTSHIPS.

IT has been previously shown that the seas adjacent to our coasts are interspersed with dangerous and sometimes extensive shoals, and that on account of these obstacles navigation is rendered difficult and often perilous. Even at so great a distance as thirty miles from land these treacherous shoals way-lay the mariner, the deep water passages between them are frequently very narrow, through which the tides run with great velocity; the open area of sea may appear to be smooth and inviting, but underneath here and there lurk the sandbanks, very little below the surface, which would be fatal to any vessel attempting to pass over them. It is obviously impossible that lighthouses on the mainland can be made serviceable in directing vessels how to thread their way through the intricacies of narrow channels running in all directions, and distant perhaps 15, 20, or 30 miles from the coast. Something more is necessary to aid the mariner when he approaches the belt of sea immediately surrounding our islands; directions must be more definite and the marks brought closer to the points or dangers requiring to be indicated. To meet these requirements, lightships or floating lights were established. It

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was not until lighthouses had been in existence for a considerable period that the idea of mooring floating lights in certain positions was carried into effect. The first lightship was placed at the Nore, at the entrance of the Thames in 1731, and proved of great service to passing navigation. On the requisition of the colliers voyaging up and down, and at the general desire of the shipping trade of the east coast, another floating light was placed in 1736 to mark the Dudgeon shoal off the coast of Lincolnshire, at the entrance of the Wash, so that with easterly winds vessels could, by keeping outside the lightship, avoid getting embayed. In those days the vessels employed as lightships were sloops, each with two lanterns fixed horizontally on a cross yard on the mast. Many years elapsed before the system was extended, but at last in 1788 the question of marking the Owers Shoal off the south coast being under discussion, it was resolved to place a floating light there, and vessels bound to Portsmouth, Southampton, and the Isle of Wight are greatly assisted by it. After that, in 1790, a floating light was placed close to the Newarp Sand off the Norfolk coast, which was followed in 1795 by one moored to the N.E. of the Goodwin Sands, provided on the representation of the trade. From this vessel three lights in a triangle were first exhibited. Three years later, the Sunk lightship was placed on the extremity of the sand of that name situated at the entrance of the North Channel into the Thames. At the beginning of the present century, we find the Galloper Sand at the Thames entrance and the Gull stream between the Goodwins and the mainland marked by floating lights, and on coming to our own times, we find there are no less than 50 lightships now in position for guiding and warning purposes around the English coasts; 10 to indicate the shoals and channels adjacent to the shores of Ireland, but none at all employed on the Scotch seaboard. The reason for the absence of lightships around Scotland is because its coasts are rocky and not friable, very few sand or mud shoals are formed in the adjacent waters, and lighthouses on the salient points of the mainland or on the isolated rocks are sufficient for the purposes required, the water being nearly always of good depth close to the shore, consequently lightships are not needed.

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English light-vessels are always painted red, those on the Irish Coast black, with the name in large white letters on both sides. Other distinguishing characteristics by day are that at the masthead a large wooden globe, diamond or other shape is carried, and at the foot of the mast is the lantern, which is lowered on to the deck in the day time, but hoisted up the mast when lighted. If two lights are shown from a light-vessel, she has two masts and two lanterns.

The most important matters in connection with lightships, are the lights exhibited from them, and the method by which they are moored at their stations, so that they ride securely through the most tempestuous weather.

The lantern encircles the mast, and contains a number of Argand lamps and reflectors. If the character of the light is fixed, the lamps are fitted so that they send out a constant band of light all round; if revolving, a certain number of lamps and reflectors (3, 5 or 7) are fitted on to a framework in a vertical plane, and three or more of such faces, as they are called, are made to revolve, each face bringing round its own beam at regular intervals as appointed. The revolution of the faces is produced by means of clockwork carefully regulated, so that the beams may be caused to show themselves at the proper periods. But no doubt it will occur to many, how can an elaborate arrangement of lamps, glasses, and reflectors, be kept in position in a ship, whose lurches appear to be sufficient to displace any such arrangement. The answer is, that every lamp, with its associated cistern and reflector, is hung on a gimbal, so that it has free play in all directions; and when the vessel rolls or pitches, the lamp, by its own gravity, maintains an approximately constant vertical position. It is, of course, of the highest importance that the lamps should be properly hung, otherwise there would be endless breakage of the glass chimneys, spilling of the oil, and extinctions of the lights. The number of lamps employed on board different lightships varies from nine to as many as twenty-four. Rape or colza oil only is used—mineral oil being not yet regarded as sufficiently safe for the trying conditions under which the lights are maintained. On an average, it may be

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taken that one lamp consumes about thirty-six gallons of oil in a year; the total expenditure for the different lightships, therefore, varies according to the number of lamps employed. We have previously described the Argand lamp as used in some few lighthouses; that employed for lightships is in all respects similar; it is, therefore, needless to again explain it. The reflectors are also similar in construction, but on board lightships the smaller sized reflectors, *i.e.*, those 12 inches in diameter across the mouth, are at present more generally in use, although they are being gradually superseded by the 21-inch reflectors, the employment of which, by providing a larger divergence of the light, enables a less number of lamps to be used, the result obtained in illumination being equal to that yielded by a larger number of lamps with the small reflectors. Some further improvements in connection with these lamps have recently been made by Mr. James N. Douglass, the engineer to the Trinity House, which, it is expected, will considerably increase their power and efficiency. Every precaution is taken to insure perfect ventilation in the lanterns, without draughts or irregular puffs of air, which interfere very much with the proper burning of the lamps. In connection with the maintenance of the lights, it is very seldom that anything goes wrong. Accidents will happen at times, in spite of the greatest care, such for instance as an exceptional breakage of glass chimneys, or the clockwork machinery getting out of order, or a pane of lantern glass breaking by birds flying against it, &c. But such things are not due to any culpable negligence on the part of those in charge.

It is of course necessary that lightships should be able to be easily identified at night-time, and with that object various distinctive characteristics are applied to the lights so as to distinguish them from each other, and also from any neighbouring lighthouses. In a former chapter we have indicated the nature of the distinctions now in general use for lighthouses, and of these many are applicable for lightships, such for instance as single or double fixed lights; revolving lights with varying intervals of darkness between the beams, or with coloured beams alternating with white, or with coloured beams altogether. The system of showing a group of flashes following each other in quick succession at certain

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intervals, has also recently been successfully applied in connection with the arrangements of lamps and reflectors on board light-ships. This system affords abundance of variety without the use of colour, it being possible to diversify the lights by changing the number of flashes in a group, and by varying the intervals of darkness between the groups. The lightships of the Royal Sovereign near Beachy Head, the N.E. Goodwin, the Seven Stones off Scilly and others are distinguished by this method, and seamen speak of their effectiveness in the highest terms, and are able to recognise them with great facility.

The next point we have to consider is the method of mooring the lightships, so as to ensure their remaining at their stations and riding with safety in tempestuous weather. This is obviously as important a matter as the maintenance of the light itself. When lightships were first placed as seamarks, there were frequent instances of their breaking adrift, whereby a certain mistrust of them was engendered, which probably operated to retard their more general adoption. Of late years however the perfection of mooring chains, and the experience of many years as regards the handling of such vessels in bad weather, have combined to prevent the recurrence of such disasters, the fact being that for more than twenty years no instance of a vessel breaking adrift has occurred. The links of the mooring cable now in use are made of iron 1½-inch diameter, the chains are manufactured with the greatest care, and before being accepted for service the iron of each link is required to bear a tensile strain of 23 tons per square inch of original area, and subsequently three four-foot lengths cut from any cables selected indiscriminately are further tested for the welding, when the ultimate breaking stress must not be less than 16 tons per square inch of each side of the link. These tests are most rigorously carried out, and any chain not coming up to the requirements is at once rejected and has to be replaced by the contractor.

These chains are made in fifteen fathom lengths, with a swivel in the centre of every alternate length, and are joined by shackles, all of which have to undergo a breaking stress as severe as the links of the cable. From 210 to 315 fathoms of such chain

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cable are supplied to every lightship, that at the Seven Stones, which is moored in 40 fathoms of water, having 315 fathoms of cable. Ordinarily this cable is directly connected with a mushroom or Martin's anchor lying on the sea-bed and weighing two tons, and the lightship so moored swings round as the tide changes. Another method of mooring is with two mushroom anchors connected by a length of ground chain which lies along the sea-bottom, a mushroom being at each end. In the centre of this length of chain are a ring and swivel, to which is attached a chain of 1½-inch iron which leads up into the vessel, and by which she rides. This plan of ground moorings is employed in places where the channel to be indicated is very narrow, or whenever the vessel has but little room to swing round with the tide. The veering cable can be hove short so that the vessel swings in a very small area. In addition to the mooring cables and anchors above referred to, every lightship is supplied with two bower anchors for use in case of emergency, with an additional length of 150 fathoms of 1½-inch chain. But although it is of the utmost importance that every precaution be taken to obtain the very best quality of materials, yet it is chiefly by the skilful management of the mooring cable that a lightship is enabled to ride out the fiercest storms in safety. With a smooth sea, a short cable is sufficient, but when the waves run high it is necessary to pay out a long scope of chain, so that the ship may ride over the highest crests and plunge down into the lowest depth of the trough of the sea. It is also necessary to have a very great deal more cable out than is actually required to enable the vessel to surmount the highest waves; she must never be allowed to go to the end of her tether and pull directly upon her mushroom; as the vessel rises she takes as much chain as she requires, but still must leave a considerable quantity on the sea bed. This surplus cable by its weight acts as a spring and entirely prevents any direct jerking or straining at the mushroom. The experience of years has educated the officers of our lightships to regulate the scope of cable paid out to the necessities of the occasion. The constant rise and fall of the cable, and the swinging round of the vessel with the tide are at times the cause of strange entanglements, and it is by no means an uncommon duty for one of the steamers of the service to go out

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to "clear the moorings" of one of the lightships. In this connection we may point out that herein lies the chief obstacle to connecting lightships with the shore by means of submarine telegraphic cables. The crucial point is to get the telegraphic cable away from the lightship without risk of interference by the movements of the mooring chains as above described. The possibility of doing this has not yet been practically demonstrated, but the public, not being generally aware of the nature of the difficulties which prevent electric communication being established, and seeing only that in cases of shipwreck such a means of conveying intelligence might have been very serviceable, have been somewhat clamorous for its being forthwith carried into effect. It is to be hoped that the experiment now being made by the Trinity House will bring the desired object within the range of practicability, and that before many years are passed all lightships will be enabled to communicate with the shore by means of submarine electric cables.

In the event of success being attained in this respect, possibilities hardly thought of now will then present themselves. Even the light itself may ultimately be produced by electricity, conveyed from the shore by submarine cables; and it is more than probable that the public usefulness of lightships will be capable of great development if between them and the mainland telegraphic communication is satisfactorily established. At present the means of calling assistance from the shore consists of signal flags or guns by day, and rockets by night. The flags in most cases cannot be made out from the shore, but a passing vessel may read the signal and carry the intelligence to the nearest port. The guns are rather more effective than the flags, but with them distance most frequently prevents their being heard, although when firing commences from one lightship it is taken up by any neighbouring lightship where it may be heard, and thus the chance of the signal being answered is increased. An effort has been made to utilise carrier pigeons for conveying messages from the vessels to the shore, but although it is no doubt possible by judicious breeding, severe training, persistent care and watchfulness to make them useful under certain conditions, yet to successfully develop such a plan is work for an enthusiast who would *con amore* devote the whole of his time to

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the undertaking, and even if accomplished, the birds would only be serviceable in fair weather when least likely to be wanted, for they will not fly at night-time, in fog or falling snow, and when a gale is blowing the strongest bird is liable to be carried away to leeward.

It is quite clear that more perfect and speedy communication is a great want, and there is good reason to hope that the difficulties attendant upon the connection by means of an electric cable will, before long, be surmounted.

From lengthened experience it has been found that wood is the most suitable material for the hull of a lightship. A wooden vessel will ride at her station for seven years before requiring to be overhauled, cleaned and painted; with iron ships, on the other hand, the bottoms foul very quickly, and they have to be brought in for cleaning, &c., every three years. Furthermore, iron ships are cold and uncomfortable for the crew, and in the event of collision, are likely to be more seriously damaged than wooden hulls. The form of a lightship is adapted to her vocation, viz., to remain in one place. Her lines are not fine, nor are her bows sharp. She is very strongly built, and although a landsman would find her a most uncomfortable craft, yet in every respect she is a first-rate sea boat.

The crew attached to such a vessel numbers eleven, all told,—the master, mate, three lamplighters and six seamen. Of these, seven only are on board the vessel. The master and mate have alternate months afloat and ashore, each of the crew has two months afloat and one ashore: while on shore they have some duty allotted to them at the district depôt. Every lightship is visited once a month by the attendant steamer, which takes out those who have had their month ashore, and brings back those whose turn it is to go ashore. This visit is known as the monthly relief, and it is then that the vessel is furnished with stores, water, and provisions sufficient to last considerably beyond the time when the next month's relief would be due. This precaution is taken in case the weather should be so bad as to prevent communication with the lightship, a state of things which happens more often than is agreeable to the men waiting to go ashore. This monthly visit is not the only call that is made on the lightship

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people. The steamers of the lighthouse service are frequently running about from place to place, and visit the lightships at unlooked for times, Passing ships often give them a friendly hail, and sometimes send them a bundle of newspapers, a boon which the lightsmen appreciate most highly. Occasionally they are able to do a little business with the fishing boats, but at some stations they are able to catch a good deal of fish themselves. Now and then a shipwrecked crew has to be received and entertained, which is naturally a very important event on board. Occasionally,* and indeed much more frequently than might be supposed, a lightship is run into by a careless navigator, or a too smart captain who likes close shaving. This is a most serious matter for those on board the lightship, which is not under any sort of command as regards motion. Some years ago the *Tongue* lightship at the entrance of the Thames was run into by one of the steamers which trade regularly into and out of the river, and was cut down to the water's edge so that she sank almost immediately, the master and crew being saved with difficulty.

In a general way it can easily be understood that life on board a lightship is monotonous and wearisome, but every effort is made to occupy and divert the minds of those on board. Their daily duties are clearly defined and have to be scrupulously carried out; books in plenty are always on board, there being a circulating library in connection with the service; the men are most of them ingenious in some kind of work, such as toymaking, veneering, &c., &c., with which they occupy themselves on board. What they have to contend with is the depressing influence of the vessel being stationary, of her never going on, but remaining moored to one spot, a plaything for the waves, with the same endless, monotonous waste of waters everywhere around. There is little poetry in the sea from their point of view. But notwithstanding all this there are fortunately plenty of men willing to join the service, and avail themselves of its advantages: good pay, uniform clothes, pension when old and unfit for service, and the prospect of

* In our present number we publish an important statement on this subject.—ED. *N.M.*

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rising from seaman to be master of a lightship are inducements which attract many, and with the strict discipline which is maintained and the watchful supervision which is always exercised over the service, the vessels are efficiently manned and the lights unfailingly shown at night to the great benefit of navigation near our shores.

THE PROPOSED MERCHANT SHIPPING COUNCIL.

From a Liverpool Correspondent.

OUR local papers recently printed the particulars of the draft scheme for the constitution and work of the Shipping Council which was referred to by the President of the Board of Trade, in a visit here last autumn. It might have been expected that such an important proposal would have been the universal topic of conversation, in places where merchants most do congregate, and that it would have been seized upon with avidity by our dailies (all of which are much concerned in shipping interests), and made the subject of many leaders. Such has not, however, been the case, and on the very day of the appearance of Mr. Chamberlain's draft scheme, the all-exciting topic was not the new departure in Board of Trade action, but the Preston election, in which, one of our Liverpool celebrities, the spirited proprietor of the Landing Stage Refreshment Rooms, made his most gallant though unsuccessful attack upon a stronghold of Lancashire Conservatism, only second in that respect to our own brand new city. If one must tell the truth, the attitude of Liverpool men in general is one somewhat approaching indifference, and I think, reasons for this are not far to seek. Where an opinion is expressed it is much as follows:—"What we want most of all is to be let alone, to do our own business in own way, if there are any black sheep among us, the business of the Government is to look after them, and compel them to do right, or punish them for doing wrong, we cannot see why because some few people load their ships too deep, every shipowner must submit his load-line and the plans of his vessel to a Council."

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Mr. Chamberlain's plan is admitted to be in many respects well considered; he invites suggestions as to modification, and it is not at all doubted that he will get many wise ones, and many more unwise. We have fortunately not had in Liverpool much practical experience in the matter, but it is easy to see that there must be extreme difficulty in dealing with appeals against the action of the Board of Trade. Interference with private property is so repugnant to the feelings of Englishmen that the sympathy of most men is at the outset on the side of the shipowner interfered with, and against the meddlesome official. The interference is on behalf of the seaman and for his protection—why does not the seaman do something towards looking after himself? As a matter of fact it is as often as otherwise the case, that when the seamen complains, his complaint is groundless; he has perhaps been, or fancies he has been, shabbily treated in some ship and straightway writes to the Board of Trade denouncing the vessel as unseaworthy. In the present unfortunate condition of the law, the seaman can with impunity cry off his engagement when the vessel is ready for sea, which he does, it must be confessed with the utmost impartiality; he does not decline the inferior vessel because he has found out something against her, but it is often the case that the well-equipped first-rate Atlantic liners are only able to proceed because they have adopted arrangements for the provision of substitutes in place of the seamen who alter their minds between signing and sailing. As an instance of the difficulty of protecting people who will not protect themselves, take the results of the marked load-line, known to nautical people as Plimsoll's Mark or, as Jack facetiously puts it, "Plimsoll's Eye." The seaman perforce sees it and knows that the ship must not be loaded deeper than it, but that is about all he really does know. When he signs articles, he is told that the owner agrees to give the ship a certain freeboard, but he never stops to consider whether it is enough, in fact he scarcely ever notices what is said about it. If he has the choice of two ships, one marked to be loaded deep, and another with an extra allowance of clear side, their difference in this respect is usually the last thing which will influence him in his decision.

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One thing, it is remarked, is conspicuous by its absence from the scheme, and if it had been there, it would have been worth all the rest; that is, some proposal for improvement upon the present system of wreck inquiries. This is unsatisfactory to shipowners, but very much more so to shipmasters, who, indeed, look upon it as their greatest standing grievance. They say that as things go at present they must, although they may have commanded a large sailing ship, begin as third or fourth officer in a steamer, at £5 to £8 per month. After gradually creeping up, they may in some years get a command, and perhaps a few months after an accident happens. The inquiry is held by a lawyer with Assessors. The Assessors, to all outward appearance, play a very subordinate part in the inquiry, and what may be their influence on the ultimate decision no one but themselves knows. It may be that one or more of the Assessors has only had the sea experience of the Royal Navy, which means unlimited hands to do as little work as you like, time being no object; while in the Mercantile Marine, especially in exclusively cargo steamers, the deck hands are cut down to the lowest possible minimum. The verdict of the Court may be that the master lose his certificate for three months; whether three or eighteen is practically the same, for he has to start again as third or fourth, and the certificate will come back long before the opportunity of using it. The common remedy proposed for this by the sufferers from the system, or, if you will, by those who imagine they are sufferers, is trial by a jury of shipmasters and shipowners, the presiding legal gentleman to act as a judge merely, and to have no part in the verdict. On the face of it, this looks impracticable; but something calculated to accomplish the same end may, perhaps, grow out of Mr. Chamberlain's Shipping Council. There have been very few Courts of Survey held—none have been held in Liverpool—but practical men hold that in all technical cases the decision should rest with the practical men, helped, if you will, by the advice of a legal authority on points of law. Mr. Chamberlain, in his memorandum, refers to ultimate appeal resting upon a trial by a judge and jury, the former probably ignorant of nautical matters, the latter still more ignorant. The still worse case is, when such matters are decided

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by one who has learnt his seamanship, or his engineering, or naval architecture, from books alone, crammed, it may be, for the special occasion, and not half digested, and who may prove, to the cost of the unfortunate man whose means of living are taken from him, that—

> "A little learning is a dangerous thing;
> Drink deep, or taste not the Piérian spring:
> There shallow draughts intoxicate the brain,
> And drinking largely sobers us again."

Unfortunately, other people have to pay the penalty for the intoxication. Further, the Shipping Council might do good work, or the Government might do good work in this respect themselves, if they would, as Mr. Chamberlain appears to promise, issue instructions for the guidance of shipowners and shipmasters in matters which they have occasionally to decide upon their necessarily imperfect knowledge of the conditions of the question. They do not want to be told how to do their ordinary business; that they think they can best manage for themselves; their experience in the matter may be as valuable as the knowledge of their would-be teachers. But the carriage of gunpowder is not an every-day occurrence; dynamite still more rarely forms part of a cargo; and information as to precautions to be observed in these matters, or, indeed, authoritative regulations, would be very generally appreciated. Further, much uncertainty prevails as to the way of dealing with the ventilation of coal cargoes; most shipmasters who have any experience in the matter go with the Royal Commission on Coal Cargoes in condemning through ventilation, but underwriters and shippers' surveyors still in many cases enforce, with a view to safety, an arrangement which has been proved to be a source of danger. The Royal Commission also reported that some kinds of coal were intrinsically dangerous for carriage by sea; unfortunately, they did not enlighten us as to what kinds are thus dangerous. We do not suppose that a Shipping Council would know much about it themselves, but they might find out from people who do know, and make the information public.

The marking of load-lines is, however, altogether another matter. In this connection it is remembered that recently it was

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proposed by some eminent authorities on shipping questions to enforce the marking of a load-line on ships considerably deeper than ever the owner would think of loading them, as a part of a new method of tonnage measurement. The ships have large freeboard in order to the comfort of the passengers; the law was in their case to fix and mark the deepest line consistent with the safety of the ship, irrespective of her being a passenger steamer; in effect, to do its best to discourage large freeboard. Why, it is asked, should the law, or the Board of Trade, or the Shipping Council, interfere at all with any one who is doing his own business in the right way himself? Why should he have to hand over plans to a Council every time that, in accordance with altered circumstances, he wishes to alter the immersion of his vessel. Fix, if you will, the load-lines for men who will not honestly fix them for themselves; and if you can establish some authority to give advice to shipowners who want it, and are not able to obtain it elsewhere, even that will not affect us; but do not force on us advice that we do not want, or interference that is unnecessary in our case.

A last word as to the constitution of the Council. Half its members are to be elected, one for each of seven districts. The Liverpool and West Coast is the name of one of the districts; it would appear to extend from Carlisle to Milford. The tonnage in this district is of as diverse a character, and its various owners have probably as little in common, as could be well conceived. Sailing vessels, ranging in size from the little coaster to the largest sailing ship in the world; steamers, including ferry-boats, and the *City of Rome*. It is proposed that each shipowner should have one vote for every 100 tons of shipping owned by him; the consequence would be that a few large firms could swamp all the rest, and the Liverpool member might only represent interests which do not need representing at all. It would appear that the only chance of anything like a fair representation of various interests would be a larger local council elected by the cumulative vote, and again, electing one of their number as a member of the general council. The local council would furnish part of the jury in appeal cases, or in other maritime procedure where it might be needed.

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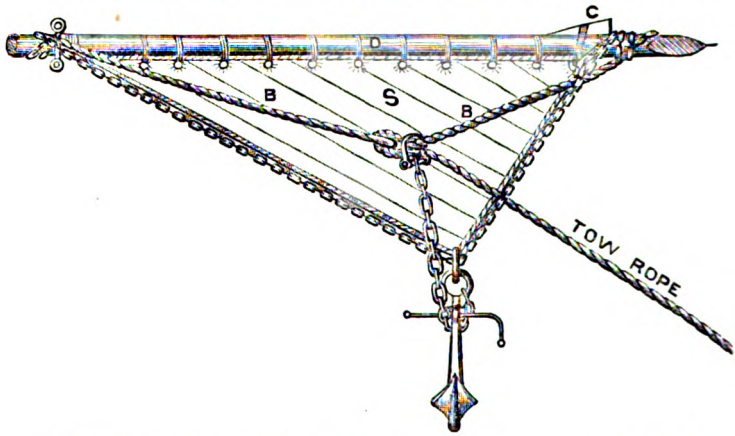
SEA ANCHORS.

IN our last number we intimated that we hoped to be furnished shortly with particulars of a good sea anchor which can be extemporised from materials lying ready on the deck. We now are able to publish the details of a plan suggested by Captain P. Thompson, Examiner in Navigation for the Board of Trade.

The cargo derrick and chain, together with the storm stay-sail offer the ready materials for constructing a sea anchor in a steamer, and is shown in the following diagram :—

D, the cargo derrick ; S, the sail bent to it ; B, the bridle ; and C, the cleat to keep that end of the bridle touching it in its place, the other end is kept fixed by the iron band on that end of the spar.



Through the shackle of a large kedge anchor the bight of the derrick chain is hitched, and the two ends taken up alongside of the after leech and foot rope and seized to them at intervals of two feet, the ends of the chain are then secured to the opposite ends of the spar.

On the other side the drag is snaked from chain to chain with two-inch rope.

A chain is passed from the anchor stock to that part of the bridle where the tow rope is secured, the whole thing is then complete.

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LAYING-TO IN A GALE.

THE accompanying letter has been published in the *New York Herald*. Its subject is one of much interest and importance to seamen; therefore, we think, our readers will be glad to peruse it:—

"Sir,—During the recent gales encountered in the Atlantic, the *Herald*, on the arrival of almost every steamer, has published interviews with the captains and officers, all of whom seem to agree that these storms were the most severe that have prevailed for some years. On reading over the files of the *Herald* after arriving from the November-December westerly passage, I found in your issue of November 17 an interview with Commander Cheyne, of the Royal Navy, a passenger on one of the Glasgow and New York steamers. After describing the terrific sea, and having been called into consultation by the captain, the Commander goes on as follows:—'Knowing himself the reality of the danger, and that if anything should happen to stop the engines the ship would inevitably fall into the trough of the sea and founder with all hands.' As this opinion of Commander Cheyne seems to be that of many steamship masters, and knowing that the *Herald* is more widely read among the masters and officers of the steamers in the North Atlantic trade than any other paper, I beg to submit for publication my experience in the matter o stopping a steamship in a gale, trusting that you may deem the matter of sufficient importance to invite the opinion of more experienced shipmasters on this subject. In November, of 1877, I was compelled by an accident to the machinery to stop in one of the heaviest gales, with the highest sea that I remember in thirty years' experience. I recall perfectly how anxiously I awaited the result on finding it inevitable that the ship must remain stopped for twenty-four hours, perhaps longer, in such a gale. I felt almost certain we should lose boats, bridges, houses and everything from the deck even if the ship lived through the gale without foundering. To my utter surprise and astonishment we lay for twelve hours, with the wind and sea from two to four points abaft the beam, without shipping a barrel of heavy water, although, of course, spray

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was constantly blowing completely over the ship. I did the same thing in February, 1880, when the alternative was to have lost boats and perhaps have done some serious damage. On our last passage on the night of November 26th, 500 miles west of Fastnet, we encountered a hurricane from the south-west, which, when it reached the coast of Ireland, was the most severe storm known for thirty years, and in which the Calf Rock Lighthouse was blown down. The sea was simply terrific, the barometer falling rapidly to 28.29 and the squalls so heavy we could only steam from one to three knots an hour. Every experienced officer knows that it is impossible to steer a ship in such weather at that speed and constantly head the sea within two or three points. As soon as the barometer stopped falling I put the ship's head to the northward and stopped the engines. Ten minutes after the wind shifted to the north-west and blew as hard as from the other quarter. We lay for eight hours with the ship's head from east-north-east to east by north and made excellent weather, shipping actually no water at all, drifting to the south-east two and a-half or three miles an hour. The above is my actual experience of stopping a screw steamship in a gale, which I send without note or comment, only remarking that in my opinion many steamers have kept on steaming against heavy gales and cross seas, uncertain as to the result of stopping, until their decks have been completely stripped, perhaps their fires put out, or even encountered more fatal mishaps; when, by stopping a few hours until the gale had settled and the sea become more regular they might have come out with comparatively slight damage. "J. W. SHACKFORD,

"American Steamship, *Illinois*."

COLLISIONS WITH LIGHTSHIPS.

IT appears to be requisite to call the serious attention of masters of vessels navigating in the vicinity of our coasts to the urgent necessity for steering courses which will certainly lead them clear of the lightships placed to guide them. The fashion of close shaving and cutting off corners, and we feel bound to add the culpable negligence

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displayed by some masters and officers when in charge, either through their carelessness or not making allowance for the set of the tide, have during the last five years caused no less than 48 collisions with lightships. One would think it scarcely needful to remind mariners of the possible serious consequences which may follow the displacement of a lightship or the extinction of her light, but in setting a course which will lead close by one of those vessels, a master incurs the risk of bringing about such a disaster, although he may be strong in asserting his abhorrence of the carelessness of men who collide with lightships. A little extra strength of tide, a very slight error in setting the course, a sudden puff of wind, a failure to answer the helm, or some other accident, may result in a collision, a contingency which possibly did not enter the master's mind. There is no possible excuse for passing vessels getting athwart hawse of the light-vessels, as a riding light is now always shown from the fore-stay of every lightship on our coast, and if this light is in line with the masthead light, mariners may know that they are in the stream of the vessel and should use every possible effort to get out of it before coming too near. The light on the fore-stay will always indicate the set of the tide, and consequently how the ship is riding. There can be no doubt that the rule should be, to use the lightship for guidance but to give her as wide a berth as safety and the necessities of the voyage will permit. We earnestly hope this will come under the notice of some who have not always been so careful as they should be.

That we are not exaggerating, a list* is appended, showing the collisions which have occurred with lightships on the English coast during the past five years.

Although many of the vessels appear to be foreign, the record is hardly creditable to us as a maritime people, and we may add that the matter has another important aspect for shipowners, for the expense of repairing the damage has in the majority of cases to be borne by the fund which is supported by the payment of light dues, or else has to be paid for by the owner of the ship doing the injury, together with a penalty of possibly £50.

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* Obligingly supplied to us from the Corporation of the Trinity House.

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LIST OF LIGHT-VESSELS COLLIDED WITH AND DAMAGED AT THEIR STATIONS DURING THE FIVE YEARS ENDING 31st DECEMBER, 1881.

Station.	Date of Collision.	By What Vessel.	Of What Port.	Extent of Damage.
Spurn	Jan. 19, '77	*Albatross*	Lowestoft	Slight.
Mouse	Apr. 16, '77	*Antoinette*	Amsterdam	Considerable.
South Sand Head...	,, 21, '77	*Isabella Leith*	Lowestoft	Slight.
Scarweather ...	,, 21, '77	*Citizen*	Youghal	Ditto
East Goodwin ...	May 15, '77	*Wohldorf*	Germany	Ditto
Sunk	,, 27, '77	*Osprey*	Harwich	Ditto
Carnarvon Bay ...	Aug. 9, '77	*Labillula*	Unknown	Ditto
Tongue	July 12, '77	*Rhine*	London	Lightship sunk.
Newarp	Aug. 11, '77	*Palma*	W. Hartlepool	Slight.
East Goodwin ...	Sep. 11, '77	Unknown	Austrian	Considerable.
South Sand Head...	Oct. 24, '77	*Deutschland*	German Iron-clad	Ditto
Tongue	Dec. 2, '77	*Deva Gungadhur*	Liverpool	Ditto
South Sand Head...	Feb. 16, '78	*Lizzie Lee*	Goole	Slight.
Spurn	,, 27, '78	*Delta*	Hull	Ditto
Newarp	Apr. 3, '78	*Cardman*	Whitby	Considerable.
Sunk	May 3, '78	Unknown	...	Boat stove in.
South Sand Head...	July 5, '78	*June*	Elsinore	Considerable.
Varne	Sept. 9, '78	Unknown	...	Slight.
St. Nicholas ...	Sep. 13, '78	*Brahmin*	Yarmouth	Considerable.
Sunk	,, 27, '78	*Neptune*	Hull	Slight.
Spurn	Nov., 30, '78	*Ann and Sophia*	Unknown	Ditto
East Goodwin ...	,, 30, '78	*Run foul of by three vessels in succession, names unknown*	...	...
Mouse	Dec. 1, '78	*Mary Jane*	Jersey	None.
Carnarvon Bay ...	,, 14, '78	*Mary Peers*	Chester	Slight.
East Goodwin ...	Mar. 21, '79	*Industre*	Braake	Ditto
Dudgeon	June 15, '79	*James Joicey*	Unknown	Ditto
Shipwash	Sept. 2, '79	Unknown	...	Ditto
Royal Sovereign ...	,, 18, '79	*Belle*	Bath, U.S.	Ditto
Princes Channel ...	Oct. 19, '79	*Shirley*	Falmouth	None.
South Sand Head...	Dec. 14, '79	*Martha Edmonds*	Unknown	Slight.
English and Welch Grounds ...	Jan. 4, '80	Unknown	,,	None.
Varne	,, 31, '80	*Warwick*	,,	Slight.
Breaksea	Feb. 4, '80	*Winsloe*	Liverpool	Considerable
Tongue	June 7, '80	*Loch Linnhe*	Unknown	Slight.
Spurn	Oct. 14, '80	*Teiro*	Riga	Ditto
Nab	,, 28, '80	*Selkirkshire*	Glasgow	Considerable.
St. Nicholas ...	Nov. 6, '80	*Lydia*	Dundee	Slight.
Gull	Feb. 12, '81	*Bengal*	Unknown	Considerable.
Mouse	Feb. 19, '81	*Little Pheasant*	,,	Slight.
Scarweather ...	Mar. 18, '81	*W. H. Marcy*	United States	Considerable.
Mouse	Apr. 20, '81	*Freia*	Frederick stadt	Ditto
Sunk	May 15, '81	*Drafna*	Drammen	Ditto
Kentish Knock ...	July 19, '81	*Amanda*	Padstow	Slight.
Gull	Aug. 12, '81	*Ilma*	Abo	Ditto
South Sand Head...	Oct. 6, '81	*Svennen*	Tousberg	None.
Sunk	,, 7, '81	*General Birch*	Drammen	Slight.
St. Nicholas ...	,, 14, '81	*Vintage*	Seaham	Ditto
Mouse	Dec. 27, '81	*Wellington*	Harwich	Ditto

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THE REVENUE DEPARTMENTS.

IN the *Nautical Magazine*, of October, 1878, it was pointed out that a Committee of the House of Commons had sat in 1862-3 upon the question of amalgamating the two great Revenue Departments of Customs and Inland Revenue. A synopsis of the evidence *pro* and *con* was given, and the inference upon the whole case assumed that such a fusion would inevitably ensue. That prediction seems on the eve of verification, if not in part already accomplished. In less than two years, subsequent to October, 1878; that is to say, soon after the present Ministry came into power—which was on the 23rd April, 1880—a small "Treasury Committee" was appointed to take evidence on the matter, and report. That Committee, it is understood, consisted of John Holms, Esq., Junior Lord of the Treasury, and Lord Frederick Cavendish, one of the First Secretaries. At all events they were the inspectors who made a practical examination of the working of the two departments in the various offices spread over the kingdom. The result is a tentative step. It has been decided by the Treasury to proceed first with the more thorough fusion of the two warehousing systems; and also a change in the mode of keeping the warehousing accounts. Under the old plan, when a merchant had to import a cargo of wine, he "passed entries" at the Custom House—the central office—and received an order to allow the cargo to be warehoused in a "Bonded Warehouse." When he wished to have any out again he was bound to pass another set of entries at the Custom House, and receive another order for the warehouse officer to deliver the goods. To keep up such a system two sets of books had to be kept officially at each port, and a third set in London. Under the new *régime*, it appears that the merchant or his representative will only be required to go to the warehouse (excepting to pay cash) and there settle the transaction at once. The advantages to the commercial public of such a plan must be obvious, especially when it is considered that the Custom Houses are sometimes at a very considerable distance from the ware-

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houses. Whether there will be as much security to the Revenue remains to be seen. There is no reason why there should not. Simplicity of transaction and account has always a tendency to arrest fraud in its incipient growth. Of course hundreds of clerks in the Customs will lose their situations, for the simple reason that they will not have anything to do. It is to be hoped that their just claims for compensation will receive due attention at the Treasury, especially when it is considered that a large sum will be saved by their "extradition" from the service. Mr. Holms, in reply to Mr. Boyce, stated, in his place in the House of Commons, on the 13th ultimo, that "the Government do not apprehend that under the new system there will be any necessity for the merchant or his representative to attend at the warehouse more frequently than at present. His business with the Customs will be transacted by the same means as his business with the proprietor of the warehouse; and as the officer and the accounts will be on the spot, there will be every opportunity for correcting errors and adjusting discrepancies, so as to facilitate the process of clearing. It is the desire of the Government to add to the convenience of trade; and if the proposed changes should be found by experience to require improvement there will be no hesitation in making the necessary alterations." To carry out the proposed changes thoroughly, a sub-committee consisting of two superior officers of Customs, and one of the Inland Revenue has been appointed; and they are visiting the out-ports with that view now. Printed regulations, if not out at the issue of this number, will very soon be published giving details of the Assimilation Warehousing Scheme; and doubtless it will come into general use on the 1st of April next—the beginning of the financial year.

The necessary and logical sequence of this preliminary change will no doubt be the complete amalgamation of the two departments—Customs and Inland Revenue.

It is idle to say that it cannot be done when other Boards more anomalous have been wedded together. Of such are the stamps, taxes, and excise. All were separate formerly. However hetero-

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geneous their elements no one advocates their dismemberment now. The Customs and Excise are naturally allied, and the marvel is that by the mere force of political or financial gravitation they did not coalesce long since. The fullness of time evidently has not arrived yet, but a few short years will probably see the fast ripening of the idea; and the Corporation of London may yet possess the old Custom House in Thames Street for adding to the Fish Market of Billingsgate. "The whirligig of time brings its revenges." Nine hundred years ago the first Customs Tax on vessels was levied at Billingsgate, and now Billingsgate threatens to swallow up the Custom House altogether.

CORRESPONDENCE.

NIGHT SIGNALS.

To the Editor of the "Nautical Magazine."

Sir,—The practical inconvenience caused by the want of a system of night signalling on the ocean, especially in the North Atlantic, has long been felt by those who have the conduct of the navigation of large steamers, and it appears to me that the great difficulty in the way of it is caused by the danger of mistaking any special lights used for the ordinary lights of a steamer or sailing ship. This difficulty I do not believe to be insuperable, and a careful consideration of the whole question has led me to propose as follows:—

The present system of distant signalling, used also in dull weather when the colour of a flag cannot be distinguished, is based upon three elements: the ball, the square flag (irrespective of colour), and the pennant (also irrespective of colour), two sets being used. By various combinations of these the whole of the first eighteen consonants in the alphabet can be made, and each consonant, when used by itself, signifies some common question or answer. Thus, L, followed by the "stop" signal, indicates "Want a pilot; can I have one?" And D, similarly used, means "No." In addition to this there are special signals when assistance of various kinds is needed, each made up of two

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symbols only. This code is well known to seamen. I propose to adapt it for night signals by substituting the red, green, and white globe lights respectively for the ball, the square flag, and the pennant. This would necessitate the carriage in the ship of two green globes only in addition to the lamps now necessary. If it should be thought likely that these lamps so used might be the cause of danger, by being mistaken for the ordinary side lights, &c., it might be provided that they should only be used to communicate with a ship which had already made signals of distress. In such circumstances the need is much felt of a means of communication by which the special difficulty or danger can be made known, and so the necessary help given without delay.

AN OFFICER IN A MAIL STEAMER.

NIGHT SIGNALLING.

To the Editor of the "Nautical Magazine."

Sir,—I have read with much pleasure and interest Captain Woolcott's letter, which appeared in a recent issue of your magazine, in reference to a system of night signalling.

I may observe that the Outer Fern or Longstone Lighthouse, to which Captain Woolcott alludes in his letter, is distant four nautical miles from North Sunderland, and at that distance, during moderately clear weather, communication can be carried on with ease and accuracy at night. The method in use is based on the Morse system of telegraphing, by means of long and short flashes. It may possibly appear at first sight that this is far too complicated for sailors to take up and put into practical use; but, judging by my own experience and that of the light-keepers, as well as that of the boatmen at North Sunderland, who answer the signals made from this lighthouse, it only requires a little care and attention to master the alphabet, and practice to be able to carry out the signalling with success.

Although the system has only been in operation a short time, it has been used with considerable advantage, as the following cases will show. During the month of January, on several occasions, strong westerly gales suddenly sprung up when the fishermen were at sea, and they had great difficulty in getting back to

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the land. One day in particular nine boats were so caught, none of which could reach North Sunderland; eight of them, however, succeeded in getting to Holy Island, and it was at once telegraphed to North Sunderland that they had arrived, but one boat was missing. As the relatives did not know which one it was, it naturally caused very much anxiety in the village, and they came to the Trinity boatman in charge of the signal-lamp to ascertain if it were possible to obtain any information from the Longstone respecting its safety. In a few minutes they received the gratifying news that the boat had safely reached the Brownsman Island, where the men obtained quarters for the night in the old lighthouse, from which a light was exhibited prior to 1826, when it was removed to the Longstone. On another day a boat was caught in a similar gale, and succeeded in getting to the Longstone just as the day was closing in. Being somewhat hazy at the time, they could not communicate with the shore; but about seven it cleared up, when the signal-lamp was got out, and the welcome news quickly flashed to North Sunderland that the crew was safe, and thus relieved the families of the men from any further anxiety as to their safety. Then, again, when some repairs were recently being carried out at this lighthouse, some materials were required, which was communicated to the shore by means of the lamp, and they were sent off in due course. The lamp is now regularly used for the requirements of the lighthouse service, and the keepers have had no special training or long practice, yet they can now communicate with ease at a distance of four miles.

The flashing lamp system of signalling at night, compared with that of signalling by means of flags by day is much less trouble, is more accurate, and occupies less time, advantages which I am sure will be readily appreciated in these days of high speed, and desire to have the movements of vessels reported as early and as frequently as possible, as well as when assistance may be required from a passing vessel at night.

I am, Sir, your most obedient servant,

B. MORTON,

Superintendent in the Trinity House Service.

Sunderland, 18th February, 1882.

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LIGHTS AND FOG-SIGNALS ON THE EAST COAST.

To the Editor of the "Nautical Magazine."

SIR,—I will feel obliged if you can find space in your valuable journal for the following :—

Having seen in the papers the stranding of the s.s. *Cobden* on Hasbro' Sands, and the s.s. *Stanton* near Cromer, I beg to say that it is a wonder to me that that those are the only ones. I do not know whether the Trinity Board have noticed that there is no fog-signal in the track of ships from the north, from Flamborough Head to the Newarp, a distance of over 100 miles, where the tide sets strongly across the track and where the lead is of very little use to find your position. There ought also to be a good sound signal in the neighbourhood of Cromer and *North Hasbro'* light-ship, everybody must admit; but I think if we had a good fog-horn at the *Dudgeon* it would be quite sufficient, for all vessels both from the Humber and ports further north steer for it, and when once found it is an easy matter for ships to enter the Would clear of Cromer and Hasbro' Sands. It is from the Head to the *Dudgeon* that ships get out of position and the lead is no guide, for there is the same depth of water both inside of the *Dudgeon* as there is outside. And as to the distance run it cannot be estimated, for my log varies from 10 to 15 miles from one voyage to another, and even more than that with spring tides. There is another complaint, that is "Blinking Tommy," I mean the wretched red light at the Corton. It is our only guide to keep us clear of over 15 miles of sands in hazy weather, for then Lowestoft cannot be seen. With regard to Corton light, surely, sir, there would not be a great amount of expense in making the light stronger, and even if there were, both with regard to the light and the fog horn, it would be to the shipowners' interest to pay it, for the time we are detained in groping about with the lead to find our position is a much greater loss than the extra light dues would amount to.

Apologising for trespassing so much on your valuable space,

I am, Sir, your obedient servant,

JAS. BLYTH,

Master s.s. *William Hunter.*

London, 2nd February, 1882.

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WATCH AND WATCH.

To the Editor of the "Nautical Magazine."

SIR,—I have been much interested in the late letters in your valuable monthly concerning "Watch and Watch," and beg a small space for a few remarks thereon. Firstly, it is argued that in the event of any accident happening with the third mate intrusted with a watch, the onus would be thrown on the master, as the third mate has no legal status. It is true that the Board of Trade do not issue third mate's certificates, but then no British vessel is *compelled by law* to carry a second mate. A legally qualified master and mate is all that is required by law; but if a second mate is carried then, *but then only*, the *mate* must be possessed of a first mate's certificate, and the second the holder of a certificate corresponding to or of higher grade than his rank. The consequence is that really the third mate question presents no difficulty at all, his being in charge relieving the master from responsibility when not personally on deck, in the same way as the second mate does at present.

I think the time has now come when vessels of some certain size ought to be compelled to carry a second mate. I could mention several steamers—one 727 tons nett register—which always clear out for Black Sea voyages with a chief mate, and a boatswain, because the latter sails for a few shillings less wages than the current second mate's wages. But I think that mates and masters could, to a great extent, and in many cases, better help themselves, as may be seen by what has happened in my own case. Some years ago I was chief mate of the s.s. *M*——, and we got a second mate, a mere lad. Shortly after leaving London, the captain complained that he could not trust the second mate at night, and suggested to me to keep six-hour watches, myself to keep from 12 to 6. This was tried and proved most satisfactory, as the master turned in, say about 11 p.m.; then I came on deck at 12 and kept the watch to 6 a.m., calling the master when I went below. But little harm could happen between 11 and 12 p.m., or between 6 and 7 a.m., except, perhaps, from passing vessels. Another great advantage was that I got much more benefit from my time for sleep, and even more time to get the work about

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decks, azimuths, &c. attended to. Unfortunately the prevalent fashion, which you so aptly call *the one man system*, throws what little of the delegated navigation is permitted or conceded on the chief mate as well as his other work on deck, aloft, &c., and consequently is often done in a slovenly manner, he being anxious to get below, and aware that the captain seldom looks at, or takes any notice of his calculations. Now this 6-hour watch is as easily kept as the 4 hours, when once used to it, and besides the before mentioned advantage it has another, viz.—all and each of the sailors are alternately in the first and second mates' watches. If the latter is, as is often the case, a mere lad fresh from his apprenticeship, this is in itself a sufficient argument for the adoption of the system. I have tried, but not always successfully, to introduce it into all the vessels I have been in since, and where I have succeded it has always worked satisfactorily. But many masters will not hear of such a change. Well! the loss is their own. I think I have here given food for the pen of some more able correspondent, and will therefore remain, Sir,

Yours most obediently,

ALEX. JACK.

North Shields, February 10th, 1882.

RIVER CRAFT AT SEA.

To the Editor of the "Nautical Magazine."

Sir,—I have just completed a passage from Bombay to Calcutta with two river craft in tow, and thinking perhaps, some account of it might interest your readers, I send a short description.

We left Bombay on 4th January, taking the vessels in tow just outside the shipping, having the steamer fast to us and the flat astern of her and using two hawsers for each. The vessels were the s.s. *Raree* and flat *Mukked*, lately belonging to the Indus Flotilla Company, manned with 16 and 8 Lascars respectively, with Captain Lind in charge. They were of the following dimensions: s.s. *Raree*, 93 tons reg., 185 ft. length, 28 ft. beam, 5 ft. 6 in. freeboard, and draft 3 ft. 2 in. aft., 3 ft. forward. Flat

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Mukked, 255 tons reg., 133 ft. length, 24 ft. beam, 6 ft. 6 in. freeboard, and draft 2 ft. 2 in. aft, 2 ft. forward; the steamer was a stern-wheeler and considerably the largest, though her tonnage was all taken up with machinery and bunkers. They were both built of corrugated steel and kept their fixed awnings, of the same material, up during the passage.

In smooth water I found that they steered remarkably well, but when we got any swell on they sheered about considerably, especially the flat. Crossing the Gulf of Manaar and again rounding the "Basses" we had a fresh breeze with a little swell, and they behaved very well on the whole, though they rolled and pitched, and occasionally gave a scend which reminded one of experiences in the Bay of Biscay. On one occasion the flat sprang a leak and we stopped for repairs, which we found could be effected with white-lead, canvas, etc., and a little ingenuity—so left a smart young officer and the carpenter on board to complete the work, for a couple of hours, while we proceeded on the voyage. On their return to the ship I was rather amused to hear that they had both been sea-sick, the motion was so rapid and the whole vessel from keel to awning vibrated so. The carpenter was the first victim and he thought he had got cholera from working in wet clothes, so that he was very delighted to find the officer also *hors de combat*. They stopped the leak however, so that we continued the voyage without difficulty.

I found that they were a greater drag on the ship than I had anticipated, our speed was reduced a good knot an hour by them. As my steamer is 3,000 tons, I did not expect they would make such a difference, it was probably owing in a great measure to our being in ballast at the time. I had to reduce speed once when they were knocking about, so as to ease the strain on them, and on the hawsers; our average towing speed was only about 7 knots.

Going up the River Hooghly we kept the steamer astern and hauled the flat alongside, and found they did not affect our steering perceptibly.

Several sea voyages have been accomplished in these seas by up country vessels, and I believe with unvarying success, though such craft are rather out of their element in salt water; but I think

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this is the first occasion on which they have gone so far across the seas. These vessels first came from Kurrachee to Bombay, and then on here, making a total of 2,660 miles from port to port.

On showing the above to the second officer, he thinks I have been rather hard on him to so describe his indisposition, but really it was the flat that ill-used him. W. E. H.

Calcutta, January 20th, 1882.

SHIPBUILDING, 1881.

IRON AND STEEL STEAMERS BUILT IN THE UNITED KINGDOM, AND REGISTERED AS NEW BRITISH SHIPS IN 1881.

Ports where Built.	No. first six months.	Gross Tonnage first six months.	No. second six months.	Gross Tonnage second six months.
Clyde Ports ...	58	94,834	61	97,636
Tyne Ports ...	45	58,499	51	76,832
Sunderland ...	29	45,764	39	66,637
The Hartlepools	14	23,076	17	28,903
Middlesbro' ...	6	9,292	8	6,231
Stockton ...	5	9,092	7	12,586
Whitby ...	2	2,844	8	5,735
London ...	8	602	7	474
Liverpool ...	7	8,886	9	14,260
Barrow ...	4	8,522	8	17,661
Belfast ...	7	10,569	5	11,090
Hull ...	3	5,766	8	4,572
Southampton	—	—	3	4,688
Whitehaven ...	2	517	2	2,828
Aberdeen ...	5	5,063	2	3,210
Grangemouth	1	180	4	1,092
Dundee ...	5	7,863	4	5,823
Leith ...	5	3,161	4	2,412
Other Ports ...	5	955	12	1,870
Total ...	211	295,385	244	364,540

Total number for the year 455

Total gross tonnage for the year ... 659,925

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STEEL STEAMERS BUILT IN THE UNITED KINGDOM AND REGISTERED AS NEW BRITISH SHIPS IN 1881.

Ports where built.	No. first six months.	Gross Tonnage first six months.	No. second six months.	Gross Tonnage second six months.
Clyde	7	18,291	10	25,479
Tyne	4	868	1	1,176
Belfast	3	8,508	3	10,124
Liverpool	2	2,463	2	3,539
London	—	—	2	157
Hull	—	—	1	1,470
Leith	—	—	1	920
Total	16	30,130	20	42,865

Total number Steel Steamers for the year ... 36

Total Steel Gross Tonnage for the year 72,995

It will thus be seen that the Steel Gross Tonnage is about eleven per cent. of the total Iron and Steel Gross Tonnage for the year. Steel shipbuilding is practically confined to the Clyde, the Mersey, and Belfast.

IRON SAILING SHIPS BUILT IN THE UNITED KINGDOM AND REGISTERED AS NEW BRITISH SHIPS IN 1881.

Ports where built.	No. first six months.	Gross Tonnage first six months.	No. second six months.	Gross Tonnage second six months.
Clyde	7	10,103	20	27,167
Tyne	1	789	—	—
Sunderland	2	2,580	3	2,950
Stockton	2	3,621	1	1,720
Liverpool	4	6,906	3	5,329
Aberdeen	1	1,383	1	1,209
Whitehaven	—	—	1	1,879
Dundee	—	—	1	898
Leith	—	—	1	944
Southampton	—	—	1	1,999
Other Ports	4	438	1	43
Total	21	25,820	33	44,138

Total number for the year 54

Total Gross Tonnage for the year 69,958

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During 1881 there were registered eight steamers of over 5,000 tons gross. They were :—

Furnessia, iron ; length, 445·1 ; breadth, 44·8 ; depth, 34·5; gross tonnage, 5,038 ; registered horse-power, 600. Built and engined by the Barrow Shipbuilding Company for the Barrow Steamship Company's line to the United States.

Missouri, iron ; length, 425·6 ; breadth, 43·6 ; depth, 35·3; gross tonnage, 5,146 ; registered horse-power, 600. Built and engined by Messrs. J. and J. Thomson and Co., of Glasgow, for Messrs. G. Warren and Co., of Liverpool, for their line from Liverpool to United States.

Carthage, iron; length, 430·1 ; breadth, 44·4 ; depth, 33·5; gross tonnage, 5,013 ; registered horse-power, 850. Built and engined by Messrs. Caird and Co., of Greenock, for the Peninsular and Oriental Steam Navigation Company, to be employed in the Australian trade.

Rome, same in all respects as *Carthage*.

Parisian, steel; length, 440·8 ; breadth, 46·2 ; depth, 33·2: tons gross, 5,359 ; registered horse-power, 800. Built and engined by Messrs. R. Napier and Sons, Glasgow, for the Allan Transatlantic line.

Alaska, iron ; length, 500 ; breadth, 50 ; depth, 38 ; tons gross, 6,932 ; registered horse-power, 1,800. Built and engined by Messrs. J. Elder and Co., of Glasgow, for the Guion Transatlantic line.

Servia, steel; length, 515 ; breadth, 52·1 ; depth, 37 ; tons gross, 7,391 ; registered horse-power, 1,000. Built and engined by Messrs. J. and G. Thompson, of Glasgow, for the Cunard Transatlantic line.

City of Rome, iron ; length, 560·2 ; breadth, 52·3 ; depth, 37; tons gross, 8,415 ; registered horse-power, 1,500. Built and engined by the Barrow Shipbuilding Company for the Inman Transatlantic line.

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THE ENGLISH AND FRENCH NAVIES.

THE following tabular statement of the comparative strength of the English and French armoured navies has recently been made public. The returns were compiled by and are in the possession of the Admiralty, and may, therefore, be regarded as accurate :—

ENGLISH.

Name.	Speed. Knots.	Armour. At Water Line.	Armour. Over Guns.	Guns. Description.	Guns. No.
Inflexible	13·8	24	†17	80 ton	4
**Majestic*	13·8	24	†17	38 ton, 4 ; 6in., 2	6
**Colossus*	14	18	†16	43 ton, 4 ; 6in., 2	6
**Ajax*	13	18	†16	34 ton, 4 ; 6in., 2	6
**Collingwood* ...	15	†18	†14	43 ton, 4 ; 6in., 2	6
Agamemnon ...	13	18	†13	34 ton, 4 ; 6in., 2	6
Dreadnought ...	14·5	14	14	38 ton	4
Thunderer	13·4	14	14	38 ton	4
Devastation ...	13·8	14	14	35 ton	4
**Conqueror*	13	†12	†12	43 ton, 2 ; 6in., 2	4
Neptune	14	12	13	38 ton, 4 ; 12 ton, 2	6
Superb	13·5	12	10	18 ton	16
Belleisle	12	12	10	25 ton	4
Alexandra	15	12	8	35 ton, 2 ; 18 ton, 10	12
Rupert	13·5	11	14	18 ton, 2 ; 6in., 2	4
Temeraire	14·5	11	8	25 ton, 4 ; 18 ton, 4	8
Orion	13·5	10	12	25 ton	4
Hotspur	12·5	10	†11	25 ton	2
**Imperieuse* ...	16	†10	†8	18 ton, 4 ; 6in., 6	10
**Warspite*	16	†10	†8	18 ton, 4 ; 6in., 6	10
Northampton ...	13	9	8	18 ton, 4 ; 12 ton, 8	12
Nelson	14	9	8	18 ton, 4 ; 12 ton, 8	12
Hercules	14·7	9	8	18 ton, 8 ; 12 ton, 2 ; 6½ ton, 4	14
Shannon	12·3	9	8	18 ton, 2 ; 12 ton, 7	9
Sultan	14	9	6	18 ton, 8 ; 12 ton, 4	12
Triumph	14	8	6	12 ton	10
Swiftsure	13·4	8	6	12 ton	10
Invincible	14	8	6	12 ton	10
Iron Duke	13·5	8	6	12 ton	10
Audacious	13	8	6	12 ton	10
Monarch	14·9	7	10	25 ton, 4 ; 12 ton, 2 ; 6½ ton, 1	7
Polyphemus ...	—	—	—	—	—
Coast Defence :—					
Glatton	12·1	12	14	25 ton	2
Gorgon	11	8	10	18 ton	4
Hydra	11	8	10	18 ton	4
Cyclops	11	8	10	18 ton	4
Hecate	10·9	8	10	18 ton	4

One ship voted for 1881 and 1882.

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FRENCH.

Name.	Speed. Knots.	Armour. At Water-Line.	Armour. Over Guns.	Guns. Description.	Guns. No.
*Admiral Baudin ...	15	21½	16½	75 ton	4
*Formidable ...	15	21½	16½	75 ton	4
*Caiman	14½	†20	†18	72 ton	2
*Indomptable ...	14½	†20	†18	72 ton	2
*Roquin	14½	†20	†18	72 ton	2
*Terrible	14½	†20	†18	72 ton	2
*Admiral Duperré...	14½	21½	15¾	48 ton	4
*Foudroyant ...	14½	15	11¾	48 ton, 4; 20½ ton, 4	8
*Devastation ...	14½	15	11¾	48 ton, 4; 20 ton, 2	6
Redoubtable ...	14¾	14	11¾	20½ ton	8
*Duguesclin ...	14	†10	†8	14 ton, 4; 7¾ ton, 1	5
*Vauban	14	†10	†8	14 ton, 4; 7¾ ton, 1	5
*Bayard	14½	†10	†8	14 ton, 4; 7¾ ton, 1	5
*Turenne	14½	†10	†8	14 ton, 4; 7¾ ton, 1	5
*Magenta	15	(?)	(?)	48 ton, 2; 20½ ton, 2	4
*Hoche	14½	—	—	48 ton	3
*Marceau	14½	—	—	48 ton	3
*Neptune	15	—	—	48 ton, 2; 20½ ton, 2	4
Colbert	14½	9	6½	20½ ton, 8; 14 ton, 1	9
Trident	14½	9	6½	20½ ton, 6; 14 ton, 4	10
Richelieu	14	9	6½	20½ ton, 6; 14 ton, 5	11
Friedland	13·3	9	6½	20½ ton	8
Marengo	13·3	9	6½	20½ ton, 4; 14 ton, 4	8
Suffren	13·3	9	6½	20½ ton, 4; 14 ton, 4	8
Océan	13·8	9	6½	20½ ton, 4; 14 ton, 4	8
Lagalissonière ...	12·5	6	4¾	14 ton, 6; 7¾ ton, 1	7
Victorieux	12·8	6	4¾	14 ton, 6; 7¾ ton, 1	7
Triomphante ...	12·5	6	4¾	14 ton, 6; 7¾ ton, 1	7
Coast Defence:—					
*Vengeur	11¾	13	13¾	48 ton	2
Tonnant	11¾	17¾	13½	48 ton	2
(*Four ships voted for* 1881-82):—					
*Fulminante ...	12	13	14	34 ton	2
*Furieux	12	14	19	34 ton	2
Tonnerre	13¾	13	14	20½ ton	2
Tempête	11¾	13	11¾	20½ ton	2

Those marked thus* are in course of construction, and† steel-faced.

Built and building, there are thus 88 armour-clad ships of all kinds belonging to each country. Of sea-going ships the English have 23 commissioned and in the reserve and nine building and completing for sea; while the French have 11 of the former and 17 of the latter. Of coast defence ships, the English have 5, and the French 6. One armour-clad sea-going ship is to be laid down during the present year, while the French have taken votes for

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two first-class and two second-class ships. Of the total the English have 10 protected by steel-faced armour over the guns, and 4 at the water-line, while the French have 12 ships protected at both points. The averages of armour are as follow:—In the English fleet the average thickness at the water-line is 11·6in., including 4 steel-faced ships having an average thickness of 12·5in.; while in the French fleet the average thickness is 13·1in., including 12 steel-faced ships with an average thickness of 15in. The protection over the guns is an average of 10·5in. in the English, including the 10 ships which have an average of 13·2in. of steel-faced armour; and a total average of 11·5in. in the French navy, including the 12 ships which have an average thickness of 13in. of steel-faced armour over the guns. In the ships intended for coast defence, the 6 English give an average thickness of 8·8in. of armour at the water-line and 6in. over the guns. The 6 ships of similar construction in the French navy give 14in. of armour at the water-line and 14·3in. over the guns. The average speed of the whole fleets is 13·4 knots in the English and 14 knots in the French, although as a matter of fact as 22 of the latter are only in course of construction, the speed which they will realize under trial is a mere matter of speculation. The number of guns in the English fleet is 236, weighing 4,702 tons, or 19·9 tons per ship; while the total of 164 guns in the French, weighing 4,630 tons, gives 28·2 tons to each ship. It must also be observed that while the English fleet has not a breech-loading gun, the French adopt no other kind.

Floating Wreck Westward of Scilly Islands.—The master of the British steam-vessel *Bolivia* reports having passed, on 22nd January, 1882, the wreck of a barque (mizen-mast, 6 feet of fore-mast and bowsprit standing), hull deeply immersed, in lat. 49° 4′ N., long. 20° 44′ W., about 600 miles westward of Scilly Islands. This would be in the track of shipping bound into or out of the English Channel. In this locality the drift current may be considered to set in an E.N.E. direction (*true*) at the rate of about one-third of a mile an hour.

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BOOKS RECEIVED.

The British Navy: its Strength, Resources, and Administration. By Sir Thomas Brassey, K.C.B., M.P., M.A., &c. London: Longmans, Green & Co. 1882.

THE work before us is the first of a series of six volumes, three of which will be devoted to descriptions of the most important ironclads and unarmoured vessels, whether in the British or in foreign navies; to armour, armament, torpedoes, torpedo-vessels, and other cognate subjects; and to the collection of opinions on the main subjects of controversy with reference to our shipbuilding policy. The remaining volumes will be collateral to the first three, but take a wider range of subjects, extending even to the Mercantile Marine. Thus it will be seen that there is no purpose of writing a history of the British Navy as it was in the past, but rather the collection of information on the strength, resources, and administration of the Navy as it exists to-day. Sir Thomas Brassey has had great facilities for the production of such a work; and we should have been much disappointed if his well-known industry, together with his devotion to naval affairs, had not resulted in his accomplishing with accuracy and ability, the task he has voluntarily set himself. Part I. is devoted to *Shipbuilding for the purposes of War*. The arrangement of the letterpress relating to the subject is such as takes the reader from ship to ship, from system to system, from design to design, so distinctly, and with such perspicuity, that there is no confusion amidst the mass of figures, facts, references, and illustrations that necessarily occupy much of the work,—for these are indeed the very points of the story that Sir Thomas Brassey has to tell. It is well to know that there are at the end of the book fourteen large plates with plans of 44 vessels, 25 general illustrations representative of the principal ironclads of different nations, and 311 figures illustrative of design. The work is valuable inasmuch as it shows us how we stand as a maritime power, and we much like the views of the author as to our capacity for fighting if need be. It must never be forgotten that when entering into a struggle for that supremacy

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of the seas which involves the preservation of our own coasts from danger, and the protection of a vast and wide-spread commerce, we must look to meeting powers who are ready to attack, and who will allow us brief space to prepare. A sufficient fleet must in such an event be *ready*, not waiting the chances of a hurried creation.

The author does not pretend that his work is anything more than a compilation, but it is proper to observe that it is a compilation of a most laborious and painstaking kind, and that every book, speech, or periodical containing anything bearing upon the matter in hand has been laid under contribution. Although in a pecuniary sense it is not at all likely to be successful, yet the volume will for ages have an historical value; it will also unquestionably take its place as a standard work of reference on questions of naval science, and will permanently identify the name of its compiler with the development of the maritime power and interests of this country.

Seamanship. By Sir George S. Nares, K.C.B., R.N. Sixth Edition, enlarged and revised by Lieut. Arthur C. B. Bromley, R.N. Portsmouth: Griffin and Co. London: Simpkin, Marshall and Co. 1882.

THIS new edition of Sir George Nares' invaluable work bears evident traces of his more immediate connection with the Mercantile Marine at the Board of Trade, although we were not aware that, as stated on the title page, he was directly attached to the Marine Department of that Office. Earlier editions appear to have been almost exclusively identified with the seamanship and manœuvres of the ships of the Royal Navy, but the volume now issued includes a good deal of information which is useful, chiefly in connection with vessels of the merchant navy, and with which Sir George has no doubt been much concerned in his official capacity. Of course this adds considerably to the value of the work, but for all this it is still more applicable to the requirements of officers of the Royal Navy. In this respect the book will never lose its reputation as being unquestionably the best work of the kind that can be placed in the hands of young officers, and the

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most serviceable for purposes of reference by those whose memories may at times fail them in connection with the details of bends and hitches, knots and splices, seizings and lashings, or the fittings and uses of standing and running rigging, &c. There are also ample instructions as to mooring and unmooring, tacking and wearing, making and shortening sail, trimming sails, and manœuvring in general under all variety of circumstances.

The arrangement of the matter can hardly be called systematic, but while the table of contents indicates the order and range of subjects, a copious index at the end sufficiently supplies a ready reference to any particular point on which immediate information may be required. It may, however, be said, that the work altogether is brought down to date, and that the 420 illustrations, many of them really admirable, together with 12 coloured plates, clearly delineate the technicalities of the text. It is undoubtedly the most complete and plainly written manual of seamanship that we possess, and as a consequence should have a very extensive sale.

Annual Report of the Supervising Surgeon-General of the Marine Hospital Service of the United States for the Fiscal Year, 1881. Washington, U.S.

This report, though chiefly devoted to useful statistical and sanitary information in connection with the various marine hospitals established in the United States, adheres to the usual practice of discussing special medical cases that have presented themselves for treatment for the first time among seamen. A rare disease, the *beri-beri* of Ceylon, a kind of dropsy connected with a depraved state of the blood, having shown itself on board a Brazilian corvette in San Francisco harbour, was the special subject of investigation in 1880-81 ; and some valuable reports from various sources are here collected for the instruction of practitioners attached to seamen's hospitals. The system which enables the "blood-money men to control the sailor market" in almost every American port, and the "burning fact that crews are openly sold like cattle," come in, very properly, for severe castigation. It is also worthy of note that a pilot who could distinguish colours when close at hand, was unable to do so when they were removed to a distance.

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The Newcastle (N.S.W.) Nautical Almanac, Directory and Guide to the Port of Newcastle for the Year 1882. Newcastle (N.S.W.): R. C. Knaggs & Co.

We always feel great pleasure in announcing the issue of this almanac. Its abundant accurate information is dispensed for the small sum of three shillings, and the work should consequently be well patronised. It is ephemeris, epitome, and sailing directions rolled into one, so far as eastern navigation is concerned.

The Protection of Submarine Cables.—The submarine telegraph companies have suggested to the Board of Trade the enactment of the following provisions for the protection of submarine cables:—1. That submarine cables should be entitled to protection against negligent or intentional injury wherever occasioned, and that the damages recovered should be exemplary whenever the injury done should be unnecessary and wilful. 2. That vessels should be directed not to anchor within, say, one mile of the line of a submarine cable as laid down by the charts, unless in case of necessity caused by stress of weather or other sufficient cause, and that in the event of ships so anchoring and fouling the cables, stringent precautions should be observed in recovering the anchor. 3. That the companies should be bound to make good the loss of anchors, chains, and other gear when *bonâ fide* sacrificed to prevent damage to telegraph cables. 4. That vessels and fishing boats should be compelled to keep clear of steamers and buoys employed in laying and repairing submarine cables. 5. That in respect of the use of trawls improperly repaired and unduly dangerous to cables, a right of inspecting trawls and of requiring that they should not have projecting and ragged pieces should be vested in the Customs or coastguard or other local authorities. 6. That trawlers should be directed to act with caution while dragging across ground where cables are known to lie, and that in case of fouling the cables the same regulation should be observed as above suggested in case of anchoring and fouling. 7. That all vessels and fishing craft should be liable in damages wherever negligent or intentional injury to submarine cables, telegraph buoys, and other laying or repairing gear can be proved against them.

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MARINE INVENTIONS.

Monthly List of Patents—Compiled for this Journal by Messrs. W. P. Thompson and Boult, British and International Patent and Trademark Agents and Consulting Engineers, 323, High Holborn, London, W.C.; Berridge Street, Leicester; also by Messrs. W. P. Thompson & Co., 6, Lord Street, Liverpool.

NEW PATENTS.

227. George William Hart, of 22, Ordnance Row, Portsea, Hants. "An improved range finder for ascertaining distances at sea or on land."

251. Robert Pickwell, of Kingston-upon-Hull, York. "Improvements in recording instruments chiefly for use on board ship."

259. Richard Richards, of Manchester. "Improvements in floating vessels and apparatus for raising ships and other submerged bodies."

284. Trajan Teodoresco, of Galatz, Roumania. "Improvements in vessels or apparatus for submarine purposes."

292. Henry Lumley, of St. James's Street, Middlesex. "Improvements in rudders."

356. John McAdams, of Boston, Massachusetts, U.S.A. "Improved means for arresting the progress of ships and other vessels." (A communication.)

400. Charles Corneby, of Poplar, Middlesex. "An improved revolving propeller for steam-vessels."

407. William Fewster, of Pier Office, Margate, Kent. "Improvements and apparatus for saving life and property at sea."

603. Giovani Constante Parini, of Coneiglio di Rumo, Lombardy, Italy. "Improvements in or relating to propellers for vessels."

628. Thomas Ridley Oswald, of Southampton. "Improvements in twin-screw ships or vessels."

719. John Cooke, of Howe Villa, Richmond, York. "Improvements in apparatus for propelling and steering ships or vessels."

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PATENTS PUBLISHED.

2278. May 24th, 1881. Price 6d. Arthur Verity, of Bramley, near Leeds, in the county of York. "Improvements in the construction of couplings for screw propellers and other shafts." This invention consists of an arrangement of couplings, whereby strained or bent shafting or shafts at an angle to each other may be coupled together and a rotary motion transmitted from one to the other. These improvements are applicable to screw propellers or other shafting. The two ends of the shafts to be connected are recessed or cupped to receive a ball between them. This ball retains the axes of the end of each shaft at an equal distance from its centre without retarding or interfering with the motion thereof. Bossed discs or coupling plates are provided, and have suitable projections or lugs which are geared together similarly to a toothed clutch. The outer end of one of the plates or discs is convex and a concave disc or plate is fitted thereon and made concentric with the aforesaid ball. An ordinary compensation bearing may be used in combination with the above-described coupling.

2808. John Gladwyn Jebb, of 5, Austin Friars, London, E.C., a communication from William Benjamin Barker, of Hoboken, New Jersey, United States, 27th June, 1881. "Improvements in signalling by sound in fogs for sea and river navigation, and in apparatus therefor." The object of this invention is to facilitate the distinguishing of short sounds from long ones when such sounds are used for signalling. In one case the same notes are used as heretofore, the long note (or in some cases the short one) being however caused to vibrate. The mechanism for producing this effect is as follows: Air is compressed in a cylinder by means of a suitably driven piston. At the outer part of the framing there is a rod carrying a pinion, and by means of the latter the issuing of the sound is regulated.

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TIDE TABLES FOR MARCH, 1882.

Also Ports of Reference for the Constants in the next Table.

Week Day.	Month Day.	London Bridge.		Hull.		North Shields		Leith.		Devonport.		Dover.		Weston-super-Mare.		Liverpool.		Greenock.		Queenstown.		Kings Town.		Londonderry.		Brest.	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
		H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
W	1	11 57	—	4 7	4 37	1 12	1 40	0 5	0 33	2 53	3 26	8 48	9 15	4 17	4 47	9 11	9 35	9 46	10 13	2 36	3 4	8 58	9 25	5 55	6 16	1 33	1 59
Th	2	0 27	0 53	5 2	5 22	2 2	2 21	0 56	1 15	3 55	4 20	9 37	9 57	5 14	5 37	9 55	10 13	10 35	10 54	3 28	3 49	9 48	10 8	6 35	6 54	2 20	2 39
F	3	1 14	1 34	5 40	5 57	2 39	2 56	1 34	1 52	4 42	5 2	10 16	10 35	5 58	6 17	10 30	10 47	11 13	11 32	4 8	4 26	10 25	10 40	7 12	7 30	2 56	3 13
S	4	1 53	2 9	6 14	6 31	3 11	3 26	2 9	2 25	5 21	5 38	10 53	11 10	6 35	6 52	11 4	11 20	11 50	—	4 42	4 58	10 55	11 10	7 47	8 3	3 29	3 44
S	5	2 24	2 38	6 47	7 3	3 41	3 56	2 40	2 54	5 55	6 12	11 27	11 43	7 8	7 24	11 35	11 50	0 7	0 23	5 14	5 30	11 24	11 38	8 17	8 31	3 59	4 14
M	6	2 54	3 7	7 18	7 33	4 11	4 26	3 7	3 21	6 28	6 43	11 59	—	7 40	7 55	—	0 5	0 39	0 55	5 46	6 2	11 52	—	8 44	8 58	4 29	4 44
Tu	7	3 21	3 35	7 48	8 3	4 41	4 56	3 36	3 51	6 58	7 12	0 16	0 33	8 10	8 25	0 20	0 35	1 11	1 26	6 18	6 33	0 8	0 24	9 12	9 26	4 59	5 14
W	8	3 49	4 5	8 18	8 34	5 12	5 28	4 6	4 22	7 25	7 38	0 50	1 7	8 39	8 54	0 50	1 6	1 41	1 56	6 48	7 4	0 40	0 56	9 40	9 55	5 29	5 45
Th	9	4 21	4 36	8 50	9 6	5 44	6 1	4 38	4 55	7 53	8 9	1 24	1 41	9 9	9 24	1 22	1 38	2 11	2 27	7 20	7 37	1 13	1 30	10 10	10 27	6 1	6 18
F	10	4 52	5 7	9 23	9 41	6 19	6 37	5 18	5 31	8 25	8 41	1 58	2 16	9 39	9 55	1 54	2 11	2 44	3 1	7 54	8 11	1 48	2 6	10 45	11 5	6 35	6 53
S	11	5 24	5 42	10 0	10 20	6 56	7 17	5 51	6 13	8 58	9 18	2 35	2 55	10 12	10 29	2 29	2 48	3 19	3 38	8 29	8 49	2 25	2 47	11 29	11 59	7 14	7 37
S	12	6 8	6 25	10 44	11 13	7 42	8 11	6 38	7 6	9 40	10 5	3 17	3 41	10 49	11 14	3 10	3 35	3 59	4 24	9 13	9 39	3 11	3 37	—	0 34	8 2	8 30
M	13	6 52	7 21	11 47	—	8 43	9 22	7 38	8 16	10 34	11 7	4 8	4 38	11 44	—	4 5	4 41	4 52	5 25	10 10	10 47	4 8	4 45	1 12	1 56	9 8	9 48
Tu	14	7 56	8 35	0 26	1 7	10 6	10 51	8 59	9 45	11 46	—	5 12	5 51	0 22	1 5	5 23	6 11	6 3	6 46	11 30	—	5 27	6 9	2 44	3 28	10 29	11 17
W	15	9 23	10 12	1 49	2 30	11 35	—	10 29	11 9	0 32	1 19	6 32	7 15	1 52	2 37	7 0	7 44	7 31	8 14	0 16	1 1	6 50	7 30	4 8	4 49	—	0 1
Th	16	10 58	11 33	3 10	3 46	0 15	0 51	11 44	—	2 5	2 44	7 55	8 31	3 19	3 58	8 22	8 53	8 58	9 28	1 42	2 19	8 6	8 40	5 12	5 36	0 41	1 16
F	17	—	0 7	4 19	4 47	1 21	1 46	0 15	0 40	3 21	3 53	9 0	9 27	4 33	5 4	9 20	9 43	9 57	10 24	2 49	3 17	9 10	9 37	6 0	6 24	1 44	2 8
S	18	0 36	1 2	5 10	5 33	2 9	2 31	1 4	1 26	4 22	4 49	9 52	10 17	5 32	5 58	10 6	10 29	10 49	11 13	3 43	4 7	10 0	10 21	6 48	7 11	2 32	2 55
S	19	1 20	1 49	5 56	6 19	2 53	3 15	1 50	2 12	5 13	5 37	10 42	11 7	6 23	6 48	10 52	11 15	11 37	—	4 31	4 55	10 42	11 4	7 34	7 57	3 18	3 40
M	20	2 9	2 32	6 42	7 5	3 37	3 59	2 34	2 56	6 1	6 24	11 31	11 55	7 12	7 35	11 38	—	0 1	0 25	5 19	5 42	11 26	11 48	8 19	8 39	4 2	4 24
Tu	21	2 53	3 14	7 28	7 51	4 21	4 43	3 16	3 37	6 47	7 8	—	0 19	7 56	8 17	0 1	0 23	0 49	1 11	6 4	6 26	—	0 10	8 59	9 19	4 46	5 7
W	22	3 37	3 56	8 12	8 33	5 4	5 25	3 58	4 19	7 28	7 47	0 43	1 6	8 37	8 56	0 44	1 4	1 33	1 54	6 46	7 6	0 32	0 54	9 38	9 57	5 27	5 47
Th	23	4 18	4 38	8 52	9 13	5 46	6 8	4 40	5 1	8 6	8 25	1 28	1 49	9 15	9 34	1 24	1 44	2 14	2 34	7 26	7 46	1 16	1 38	10 16	10 37	6 8	6 29
F	24	5 0	5 19	9 34	9 56	6 30	6 52	5 23	5 46	8 44	9 3	2 10	2 32	9 52	10 9	2 4	2 24	2 54	3 15	8 6	8 26	2 0	2 22	11 0	11 27	6 50	7 12
S	25	5 39	6 8	10 18	10 42	7 15	7 41	6 11	6 37	9 22	9 42	2 54	3 16	10 27	10 47	2 45	3 8	3 36	3 58	8 48	9 12	2 44	3 8	11 58	—	7 16	8 1
S	26	6 26	6 53	11 12	11 47	8 11	8 44	7 6	7 39	10 3	10 29	3 40	4 7	11 12	11 42	3 34	4 4	4 23	4 51	9 37	10 6	3 36	4 9	0 34	1 13	8 30	9 2
M	27	7 20	7 53	—	0 24	9 21	10 2	8 15	8 55	11 0	11 26	4 36	5 7	—	0 18	4 39	5 19	5 22	5 58	10 42	11 23	4 45	5 22	1 56	2 39	9 30	10 21
Tu	28	8 29	9 12	1 2	1 40	10 43	11 23	9 37	10 17	—	0 17	5 48	6 20	0 57	1 39	6 3	6 48	6 38	7 19	—	0 4	6 0	6 38	3 20	3 58	11 4	11 45
W	29	10 0	10 40	2 18	2 54	—	Noon	10 54	11 26	0 59	1 40	6 58	7 36	2 19	2 58	7 28	8 3	7 58	8 34	0 44	1 22	7 15	7 49	4 28	4 57	—	0 22
Th	30	11 16	11 47	3 27	3 58	0 34	1 3	11 56	—	2 17	2 49	8 9	8 38	3 35	4 5	8 31	9 0	9 6	9 35	1 56	2 28	8 19	8 47	5 22	5 44	0 54	1 22
F	31	—	0 14	4 26	4 49	1 26	1 49	0 22	0 48	3 19	3 44	9 1	9 22	4 39	4 58	9 22	9 41	9 59	10 20	2 51	3 12	9 11	9 34	6 8	6 21	1 46	2 5

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TIDAL CONSTANTS

For Various British, Irish, and European Ports.

By applying the Tidal Constant of the place, according to its sign (+ *add*, − *sub.*), to the time of high water on the given day at the port of reference, you have the time of high water at the place sought.

Place.	Constant. H. M.	Port of Reference.
Aberdeen	−1 17	Leith
Aberystwyth	−3 52	Liverpool
Alderney	+2 59	Brest
Antwerp	+5 13	Dover
Arbroath	−0 42	Leith
Arcachon	+0 50	Brest
Arklow	−2 25	Kingstown
Ayr	−0 18	Greenock
Banff	−1 49	Leith
Bantry harbour	−1 14	Queenstown
Barnstaple bridge	−0 26	Weston-s.-Mare
Bayonne	−0 2	Brest
Beachy head & Rye bay	+0 8	Dover
Beaumaris	−0 51	Liverpool
Belfast	+2 42	Londonderry
Berwick	−1 5	N. Shields
Blyth	−0 8	N. Shields
Bordeaux	+3 3	Brest
Boulogne	+0 13	Dover
Bridport	+0 22	Devonport
Bristol & King Road	+0 19	Weston-s.-Mare
Cadiz	−2 2	Brest
Caernarvon	−1 56	Liverpool
Calais	+0 37	Dover
Campbellton	−0 23	Greenock
Cardiff	+0 2	Weston-s.-Mare
Cardigan bar	−4 22	Liverpool
Carlingford bar	−0 10	Kingstown
Chatham	−0 47	London
Cherbourg	+4 2	Brest
Coleraine	−1 37	Londonderry
Coquet Road	−0 23	N. Shields
Cordouan Tower	−0 10	Brest
Cowes (West)	−0 27	Dover
Crinan	+4 41	Greenock
Cromarty	−2 21	Leith
Dartmouth	+0 33	Devonport
Deal & Downs	+0 3	Dover
Dieppe	+7 19	Brest
Donaghadee	+0 3	Kingstown
Donegal harbour	+0 17	Queenstown
Douglas & Ramsay	−0 11	Liverpool
Dublin bar	+0 2	Kingstown
Dundalk	−0 16	Kingstown
Dungeness	−0 27	Dover
Dunkerque	+0 56	Dover
Exmouth	+0 38	Devonport
Falmouth	−0 46	Devonport
Fecamp	+6 57	Brest
Ferrol	−0 47	Brest
Flamborough head	−1 59	Hull
Fleetwood	−0 12	Liverpool
Folkestone	−0 5	Dover
Fowey	−0 29	Devonport
Finishing	+1 42	Dover
Galway bay	−0 26	Queenstown
Gibraltar	−1 27	Brest
Glasgow (Port)	+0 10	Greenock
Gloucester	+2 51	Weston-s.-Mare
Granville	+2 26	Brest
Gravesend	−0 48	London
Grimsby (Great)	−0 53	Hull
Guernsey (St. Peter)	+2 50	Brest
Hartlepool	+0 5	N. Shields
Harwich	−1 52	London
Havre	+6 4	Brest
Helgoland	+0 21	Dover
Holyhead	−1 12	Liverpool
Holy Island harbour	−0 53	N. Shields
Honfleur	+5 42	Brest
Inverness	−1 59	Leith
Jersey (St. Helier)	+2 38	Brest
Kinsale	−0 18	Queenstown
Lerwick (Shetland)	−3 47	Leith
Limerick	+1 15	Queenstown
Lisbon bar	−1 17	Brest
Littlehampton	+0 24	Dover
Llanelly bar	−0 38	Weston-s.-Mare
Lowestoft	−4 1	London
Lynn & Boston Deep	−0 29	Hull
Margate	−2 18	London
Maryport	+0 3	Liverpool
Milford Haven entr.	−0 58	Weston-s.-Mare
Montrose	−0 52	Leith
Morlaix	+1 6	Brest
Needles point	−1 26	Dover
Newcastle	+0 23	N. Shields
Newhaven	+0 39	Dover
Newport	+0 16	Weston-s.-Mare
Nieuport	+1 6	Dover
Nore	−1 28	London
Orfordness	−2 43	London
Oporto	−1 17	Brest
Ostende	+1 13	Dover
Padstow	−1 41	Weston-s.-Mare
Peel, Isle of Man	−0 15	Liverpool
Pembroke Dock	−3 42	Weston-s.-Mare
Penzance	−1 13	Devonport
Peterhead	−1 43	Leith
Piel harbour, Barrow	−0 18	Liverpool
Plymouth breakwater	−0 6	Devonport
Poole	−2 2	Dover
Port Carlisle	+0 47	Liverpool
Portland breakwater	+1 18	Devonport
Port Patrick	−0 58	Greenock
Portsmouth	+0 29	Dover
Ramsgate	−2 19	London
Rotterdam	+4 33	Dover
Santander	−0 17	Brest
Scarborough	+0 48	N. Shields
Selsea bill	+0 33	Dover
Sheerness	−1 21	London
Shoreham	+0 22	Dover
Sligo bay	+0 17	Queenstown
Southampton	−0 42	Dover
Spurn point	−1 3	Hull
St. Ives	−2 10	Weston-s.-Mare
St. Malo	+2 18	Brest
St. Mary (Scilly)	−1 16	Devonport
St. Nazaire	−0 7	Brest
Stornoway	+6 38	Greenock
Stromness (Orkneys)	−5 17	Leith
Sunderland	−0 1	N. Shields
Swansea bay	−0 53	Weston-s.-Mare
Tay bar	−0 11	Leith
Tees bar	+0 22	N. Shields
Tenby	−1 12	Weston-s.-Mare
Thurso	−5 49	Leith
Torbay	+0 17	Devonport
Tralee bay	−0 58	Queenstown
Ushant (Ouessant)	−0 15	Brest
Valentia harbour	−1 19	Queenstown
Waterford	+0 19	Queenstown
Westport	−0 4	Queenstown
Wexford	+2 20	Queenstown
Whitby	+0 22	N. Shields
Whitehaven	−0 9	Liverpool
Wick	−2 55	Leith
Wicklow	−0 41	Kingstown
Workington	−0 19	Liverpool
Yarmouth road	−4 43	London
Youghall	+0 13	Queenstown

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MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
79	England—East Coast—Thames Entrance—East Oaze Buoy	Caution in avigation.
80	„ „ „ Great Yarmouth Harbour	Tidal lights and signals.
81	„ „ „ River Humber—Grimsby	New buoy.
82	„ West Coast—Bristol Channel West Usk Buoy	Alteration in character.
83	„ „ „ Liverpool Bay — Crosby Channel—Pillar Bell Beacon	Replaced in position.
84	„ „ „ Morecambe Bay —Walney Island	Tidal light altered in position.
85	Scotland—East Coast—Firth of Forth—Sand End Buoy	Altered in position.
86	North Sea—Maas River—Brouwershaven Gat—Haamstede Light	Altered in position.
87	Norway — South Coast — Farsund Approach—Færökalven Rock	Reflector removed.
88	„ Christiansand Fiord Entrance —Oxö Island Light	Intended temporary discontinuance.
89	Baltic — Prussia — Curische Haff—Deime River	Beacon lights at entrance.
90	„ Gulf of Finland—Paker Ort Lighthouse	Ice signals.
91	Mediterranean — Spain—Cape de Gata Light	Limit of visibility.
92	„ „ La Garrucha	Permanent light exhibited.
93	„ „ Port Barcelona	New mole head lights, buoy withdrawn.
94	„ France — Port Nouvelle	Alteration in lights.
95	„ Sardinia — Cagliari Bay—Cape St. Elia	Particulars of light.
96	„ Adriatic—West Coast —Barletta	Buoy marking progress of mole.
97	„ „ Dalmatia — Puntadura Island	Particulars of lights.
98	„ „ Brazza Island	Particulars of lights at ports Milna and St. Martino.
99	„ „ Lesina Island—Citta Vecchia	Particulars of light.
100	„ „ Stagno Piccolo Channel	Beacon on Kranjak shoal.
101	„ Grecian Archipelago —Amorgo Island—Port Vathy—Cape Elias	New light.
102	„ Cyprus — Larnaka and Famagousta	Particulars of buoyage.
103	„ Africa — North Coast —Egypt—Alexandria	Particulars of lights and buoyage.
104	North Atlantic—Cape Verde Islands—Sal Island—Mordeira Bay	Shoal ground off Turtle point.
105	Indian Ocean—Réunion—North Coast—Bel-air Lighthouse	Marked by two red bands
106	China Sea—Carimata Strait — Montaran Island—Reef	Particulars of Catherine or Evans reef.
107	China — East Coast — Canton River—Haeshin and Shamien Rocks	Rocks marked by lighted buoys.
108	South Australia—Spencer Gulf—Corny Point Light	Delay in exhibition.
109	South America—British Guiana—Demerara River	Position of light-vessel.
110	United States — Maryland — Sharp Island	New light.
111	„ Connecticut—Stamford Harbour—Harbour Ledge	New light and fog-bell.
112	Canada — Nova Scotia — Jedore Rock	Particulars of new light.

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NAUTICAL NOTICES.

All Bearings Magnetic, unless otherwise stated.

79.—ENGLAND.—*Thames Entrance.—Gas Buoy at East Oaze.—Caution.*—The buoy at this station having several times, since its illumination with gas, been damaged by collision or otherwise, whereby its light has been extinguished, to the great detriment of navigation by night, mariners are cautioned that many fishing vessels anchor in the neighbourhood of the buoy and show a single white light, so that the gas buoy must only be used as a collateral aid, and it is still necessary to adhere to the sailing rules hitherto in force, especially when passing by night between the Princes channel and the Mouse lightships.

80.—ENGLAND.—*East Coast.—Great Yarmouth Harbour.—Tidal Lights and Signals.*

BY NIGHT.—A *red* light will be exhibited (as hitherto) on the South pier, at the entrance to the harbour of Great Yarmouth, during the time the flood stream runs into the harbour. When the ebb makes out, it will be replaced by a *green* light, which will be continued until the water has fallen to one foot on the tide gauge; the green light will then be withdrawn and not shown again until the tide has risen to the same height—viz., one foot on the tide gauge, and then continued until the flood makes in. In gales or strong winds from the southward and eastward, when there is a heavy breaking sea far out beyond the bar, rendering it dangerous for any vessel or boat to run in, the green light will not be shown. In case and during the continuance of any obstruction within or without the entrance of the harbour, rendering it dangerous for any vessel or boat to run in, no light will be shown. Masters of vessels and boats are cautioned, when running for the harbour on the ebb tide, to be extremely careful, and guard against being forced by it foul of the North pier or on the sand which extends out eastward from it.

BY DAY.—A *red* flag will be hoisted (as hitherto) on the South pier during the time the flood stream runs into the harbour. In case

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and during the continuance of any obstruction within or without the entrance of the harbour rendering it dangerous for any vessel or boat to run in, *two black balls* will be hoisted on the signal staff on the South pier, and the red flag will be lowered.

81.—ENGLAND.—*East Coast.—River Humber.—Grimsby Inner Roads.—New Buoy.*—In order to facilitate the navigation of the inner roads of Grimsby, a small wooden buoy painted black with a staff six feet long has been placed on the inner part of the S.E. end of the Burcom sand in 10 feet at low water ordinary spring tides, with the following marks and bearings:—Grimsby hydraulic tower, W. by S. ½ S.; Middle floating light-vessel, E. by N. ¼ N.; Killingholme lights open to the southward, N.W. ¼ N.

82.—ENGLAND.—*West Coast.—Bristol Channel.—Alteration in Character of the West Usk Buoy.*—It is intended to alter, at an early date, the character of the West Usk Buoy from a 6 feet can to a bell buoy. Further notice will be given.

83.—ENGLAND.—*West Coast.—Liverpool Bay.—Crosby Channel. —Pillar Bell Beacon Replaced.*—With reference to Notice No. 42, p. 139, on Pillar bell beacon, south-westward of Crosby light-vessel, having sunk, and a red *can* buoy with perch having been substituted therefor; on 23rd January, 1882, Pillar bell beacon (C. 3 red) was replaced in position off Askew spit, one-third of a mile S.W. ½ S. from Crosby light-vessel; and the red can buoy with perch was withdrawn. *Variation*, 20¼° *W.*

84.—ENGLAND.—*West Coast. — Morecambe Bay. — Walney Island.—Alteration of Position of Hawse Point Tidal Light.*—On and after April 1st, 1882, the Tidal light (red) on Hawse point, south end of Walney island, will be removed E. by S. ½ S. *southerly* 162 feet seaward, and 494 yards from Walney lighthouse.

85.—SCOTLAND.—*East Coast.—Firth of Forth.—Sand End Buoy.—Altered in Position.*—In consequence of Burntisland sands having extended in a W.S.W. direction to such a distance that the Sand End buoy in its original position did not effectually guard that danger, this buoy has been shifted about 2 cables W.S.W., and is now moored in 4 fathoms at low water spring tides, with the following marks and bearings, viz.:—Starley hall, in line with the first coal shoot north of lighthouse on Burntisland East pier,

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N.W. ½ N. The most western house on the south side of the "Bin," in line with the east extremity of Lammerlawn, N. by W. Halfway house between Burntisland and Kinghorn, in line with the Black Rock, N.E.

86.—NORTH SEA.—*Maas River.—Brouwershaven Gat.—Haamstede Light.—Alteration in Position.*—On 1st December, 1881, the leading light Laagte van Haamstede, north coast of Schouwen island, was moved N.E. by E. ½ E. about 875 yards. Position, lat. 51° 43′ 55″ N., long. 3° 43′ 45″ E. For the navigation of the Schaar van Renesse, this light kept in line with the revolving light near the Hook of Schouwen leads over the bar, from just outside white buoy No. 6 to within black buoy No. 7, until the red light shown from the eastern lighthouse at Renesse indicates that a more easterly course should be steered towards Ossenhoek.

87.—NORWAY.—*South Coast.—Farsund Approach.—Færökalven Rock.—Reflector Removed.*—The reflector on Færökalven rock in connection with Katland islet light, in the approach to Farsund, has been removed.

88.—NORWAY.—*Christiansand Fiord Entrance.—Oxö Island Light.—Intended Temporary Discontinuance.*—In consequence of intended repairs, the light on Oxö island, western side of Christiansand fiord entrance, will be discontinued from 1st June to 15th July, 1882.

89.—BALTIC.—*Prussia.—Curische Haff.—Beacon Lights at Deime River Entrance.*—Two leading lights will be exhibited, as long as the navigation is open, from wooden beacons erected on the left bank of the mouth of Deime river, to indicate the channel for entering the river. The lights are *fixed red*, bearing from each other N.N.W. and S.S.E. distant 320 yards; the northern light is elevated 33 feet above the water, the southern light 59 feet. Approximate position of northern light, lat. 54° 53′ 20″ N., long. 21° 6′ 0″ E. The beacons are 43 and 69 feet respectively above the water. *Variation*, 6¼° *W.*

90.—BALTIC.—*Gulf of Finland.—Ice Signals at Paker Ort Lighthouse.*—From 1st January, 1882, the following signals would be exhibited from the semaphore of Paker Ort lighthouse, with regard to the state of the ice at port Baltic and Revel (Reval),

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south shore of the gulf of Finland. By day, a globe on the topmast, and at night a red light above a white light, indicate—port Baltic open, Revel closed by ice. By day a globe at the yard arm, and at night a white light above a red light, indicate—port Baltic closed by ice, Revel open. By day a globe on the topmast and a globe at the yard arm, and at night two red lights placed vertically, indicate—port Baltic and Revel closed by ice.

91.—MEDITERRANEAN.—*Spain.—Cape de Gata Light.—Limit of Visibility.*—The light exhibited on Cape de Gata is obscured northward of the bearing W. by N. ¼ N. by the land. *Variation*, 16¼° *W.*

92.—MEDITERRANEAN. — *Spain. — La Garrucha. — Permanent Light Exhibited.*—With reference to Notice in 1880, on the exhibition of a provisional light on the Castle Jesús Nazareno at la Garrucha, pending the completion of the new lighthouse, the permanent light is now exhibited from the new lighthouse. It is a *fixed white* light, elevated 63 feet above the sea, and visible from a distance of 9 miles. The lighthouse, of dark colour with keeper's dwelling in front, is situated about 54 yards N.W. of the Castle Jesús Nazareno. Position, lat. 37° 10′ 15″ N., long. 1° 49′ 0″ W.

93.—MEDITERRANEAN.—*Spain.—Port Barcelona.—Lights on Mole Heads, Buoys Withdrawn.*—Two *fixed green* lights are exhibited from perches on the heads of Barcelona and Capitania moles, to mark the entrance to the Commercial harbour, Port Barcelona; and the buoys at the end of those moles, from which lights were previously shown, have been withdrawn.

94.—MEDITERRANEAN.—*France.—Port Nouvelle.—Alterations in Lights.*—Two lights at the entrance to Port Nouvelle. The southern light is a *fixed white*, elevated 50 feet above high water, and visible from a distance of 13 miles. The lighthouse, 42 feet high, constructed of iron and painted white, is placed at the salient angle of the extended south pier. Position, lat. 43° 0′45″ N., long. 3° 4′ 0″ E. The northern light is *fixed green*, elevated 33 feet above high water, and visible from a distance of 4 miles. The lighthouse, 24 feet high, consists of a shed, constructed of iron and painted white, on iron supports, and is placed at the salient angle of the new north pier. On the exhibition of

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these lights, the light previously shown from the old salient angle of the south pier, and the light at its extremity would be discontinued.

95.—MEDITERRANEAN.—*Sardinia.—Cagliari Bay.—Particulars of Cape St. Elia Light.*—The light (fixed and flashing) on Cape St. Elia (Elias), Cagliari bay, is exhibited *every one hundred and four seconds*, as follows: red flash for *four seconds*, eclipsed *seventeen seconds*, fixed white *sixty six seconds*, eclipsed *seventeen seconds*, followed by red flash.

96.—MEDITERRANEAN.—*Adriatic. — West Coast. — Barletta. — Buoy Marking Works in Progress.*—A buoy now marks the projecting extremity of a new mole in course of construction eastward of Barletta, and which already extends from the shore a distance of 548 yards. The buoy, square in shape and painted white, is surmounted by a hoop and flag painted white and red in stripes.

97.—MEDITERRANEAN.—*Adriatic.—Dalmatia.—Particulars of Lights on Puntadura Island.*—With reference to the exhibition of two harbour lights at the western extremity of Puntadura island, the lights *(fixed white)*, placed vertically 29½ feet apart, are shown from a lighthouse 14 yards from the shore, at the N.W. extremity of the island. The upper light, exhibited from a square wooden tower rising from the western side of the keeper's dwelling, is visible through an arc of 242°, or between the bearings of N. 7° W. and S. 55° W.; elevated 50 feet above high water, and should be seen from a distance of 12 miles. The lower light, exhibited from a window of the keeper's dwelling, is visible through an arc of 219°, or between the bearings of N. 10° E. and S. 49° W.; elevated 20 feet above high water, and should be seen from a distance of 9 miles. Position approximate, lat. 44° 19′ 35″ N., long. 15° 1′ 0″ E.

98.—MEDITERRANEAN.—*Adriatic.—Brazza Island.*—

(1.) *Particulars of Light at Port Milna.*—With reference to the exhibition of a harbour light at the entrance to Port Milna, on the western side of Brazza island. The light (*fixed red*), with a sector of *green* light shown through an arc of 13° in the direction of Smerduglia rock, is exhibited from a small stone tower on

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point Biaka, 10 feet from the shore. Position approximate, lat. 43° 20′ 0″ N., long. 16° 24′ 20″ E.

Note.—Vessels approaching the anchorage at Port Milna should keep the red light in sight.

(2.) *Particulars of Light at Port St. Martino.*—With reference to the exhibition of a harbour light at port St. Martino, on the south-eastern side of Brazza island, the light (*fixed white*) is elevated 23 feet above high water, and visible from a distance of 5 miles. The lighthouse consists of a small stone tower on the S.E. side of the keeper's dwelling, and is situated on the point south-eastward of St. Martino, at the distance of 13 yards from the shore. Position approximate, lat. 43° 17′ 0″ N., long. 16° 52′ 30″ E.

99.—MEDITERRANEAN.—*Adriatic.—Lesina Island.—Particulars of Light at Citta Vecchia.*—With reference to the exhibition of a harbour light at Citta Vecchia, on the N.W. side of Lesina island, the light (*fixed green*) is elevated 23 feet above high water, and visible from a distance of 5 miles. The lighthouse consists of a small stone tower, and is situated on Point Fortino, 10 yards from the shore. Position, lat. 43° 11′ 0″ N., long. 16° 35′ 5″ E.

100.—MEDITERRANEAN.—*Adriatic.—Stagno Piccolo Channel.—Beacon on Kranjak Shoal.*—Erected in a depth of one foot water, on Kranjak shoal, in the inner part of Stagno Piccolo Channel; the beacon, constructed of masonry, painted white and 7½ feet above high water, is conical in shape with a square base.

Note.—Kranjak shoal extends from the village Hodilje to this beacon; north-eastward of the beacon the channel is clear.

101.—MEDITERRANEAN.—*Grecian Archipelago.—Amorgo Island.—Port Vathy.—Light on Cape Elias.*—Exhibited from a lighthouse erected on Cape Elias (Elie), north point of entrance to Port Vathy. It is a *fixed red* light, visible seaward through an arc of 150°, or between the bearings of S. and N.N.E. ¾ E., elevated 217 feet above the sea, and visible from a distance of 6 miles. The lighthouse, 20 feet high and white in colour, is situated 93 yards north-eastward of the extremity of the cape. Position on Admiralty chart, lat. 36° 50′ 10″ N., long. 25° 51′ 25″ E. *Variation*, 5¾° *W.*

102.—MEDITERRANEAN.—*Cyprus.*—(1.) *Larnaka.—Buoy Mark-*

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ing Telegraph Cable.—The buoy, painted red, conical in shape and surmounted by a flag, is moored in 13 fathoms water, with the following bearings and distance :—Kitti tower, S. 36° W. ; Cable house, N. 69° W., distant 8½ cables ; Larnaka lighthouse, N. 26° W. From the Cable house, the telegraph cable trends E.S.E. towards this buoy, passing about half a cable southward of it, and by thence in a S.E. by S. direction. Mariners are cautioned not to anchor in the vicinity. *Variation*, 3¼° *W*.

(2.) *Cyprus.—Famagousta Harbour.—Buoy at Entrance.—Ball Replaced by Cage*.—The ball which formerly surmounted the buoy on the south side of the entrance to Famagousta harbour, having been washed away, has been replaced by a cage.

103.—MEDITERRANEAN. — *Africa. — North Coast. — Egypt. — Alexandria.—Lights and Buoyage*.—The following details relate to the lights and buoyage of the port of Alexandria :—1. The breakwater has been extended to the eastward, so that only a boat passage, 33 feet in breadth, is left between it and Eunostos point. The light exhibited from the eastern extremity of the breakwater during construction is discontinued. 2. The light-vessel and red buoy, which, during the construction of the breakwater, were placed near its S.W. extremity, have been withdrawn. 3. The light (*fixed red*) on the S.W. extremity of the breakwater is elevated 46 feet above the sea, and should be visible from a distance of 3 miles. The lighthouse is constructed of iron, and circular in shape. 4. On the inner harbour mole head is exhibited a *fixed white* light, elevated 39 feet above the sea, and visible from a distance of 3 miles. The lighthouse is constructed of iron. 5. The outer entrance to Boghaz or Central pass is now marked by one buoy only, placed on the eastern side ; this buoy is barrel (upright) shaped, painted black and white in vertical stripes, and surmounted by a wooden truncated pyramid and ball. Entering the pass, this buoy should be left on the port hand. 6. At the inner edge of Harbour bank a buoy now lies with the following bearings :—Buheireh beacon, S. ⅛ E. ; south-west extremity of breakwater, S.W. ¾ W. 7. The northern harbour bank buoy is coloured black and white. 8. The inner harbour is occupied by a net-work of mooring buoys, laid down in pairs. *Variation*, 5¾° *W*.

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104.—North Atlantic.—*Cape Verde Islands.—Sal Island.—Mordeira Bay.—Shoal Ground off Turtle Point.*—On the authority of Rear-Admiral Périer d' Hauterivè, commanding the training squadron, shoal ground has been found to extend from Turtle point, south side of Mordeira bay, Sal island. This shoal ground, on which the French frigate *Résolue* slightly touched, is composed of coral, and extends more than one mile in a west direction from Turtle point, with depths of 3¼ to 5 fathoms over it.

Note.—Vessels entering Mordeira bay from the southward, should give Turtle point a berth of 2 miles. *Variation*, 20¼° *W.*

105.—Indian Ocean.—*Reunion.—North Coast.—Colour of Bel-air Lighthouse.*—Two *red* bands, 3¼ feet wide, have been painted on the upper part of Bel-air light-tower, on the seaward side.

106.—China Sea. — *Carimata Strait.— Montaran Islands.— Particulars of Catherine or Evans Reef.*— On this reef, which extends about 2½ cables in a N.N.W. and S.S.E. direction, with a breadth of 1¾ cable, a depth of one fathom has been found. This danger is steep-to, with depths of 8 to 15 fathoms around, and is rarely indicated by breakers or discoloured water.

107.— China.— *East Coast.— Canton River.*— (1.) *Buoy with Red Light on Haeshin Rock.*—With reference to Notice, No. 72, p. 146, on placing a buoy, from which is exhibited a *fixed green* light, on the N.E. extremity of Macao fort rock, Canton river; on 19th November, 1881, a buoy, from which is exhibited a *fixed red* light, was placed on the S.W. edge of Haeshin rock, eastward of Macao fort rock. The buoy, 6 feet in diameter, is of wood, painted red, and conical in shape; it is moored in 10 feet at low water spring tides, with the following bearings:—Tower on Macao fort, S. 24° W.; western extremity of Honan island, N. 28° W.

Note.—Vessels should pass between Macao fort rock and Haeshin rock buoys.

(2.) *Buoy with Red Light on Shamien Rock.*—Also, a buoy, from which is exhibited a *fixed red* light, has been placed on the northern extremity of the patch of rocks locally known as Shamien rocks (on which there is a depth of 10 feet of water),

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lying off the western end of Shamien bund, Canton. The buoy, 6 feet in diameter, is of wood, conical in shape, and painted red and black chequered; it is moored in two fathoms at low water spring tides, with the following bearings:—Shamien church steeple, N. 60° E.; Joss house on Fa-T (Fati) shore, S. 39° W. (*The position of this buoy is doubtful.*)

Note.—Vessels arriving should leave this buoy on the port-hand when rounding to for the anchorage. *Variation*, ¼° *E.*

108.—South Australia.—*Spencer Gulf.*—*Corny Point Light.*—*Delay in Exhibition.*—With reference to Notice in 1881, on the proposed exhibition on or about 10th January, 1882, of a light from a lighthouse to be erected on Corny point, east side of Spencer gulf. From unforeseen circumstances, the light would not be exhibited until 1st March, 1882. It will be a *fixed white* light, visible seaward through an arc of 200°, or between the bearings of N. 45° E. and S. 65° W.; elevated 98 feet above the sea, and visible from a distance of 14 miles. The lighthouse, keepers' dwellings, and store-room are painted white. Position approximate, lat. 34° 54′ 0″ S., long. 127° 1′ 0″ E. *Variation*, 4° *E.*

109.—South America.—*British Guiana.*—*Demerara River Entrance.*—*Position of Light-Vessel.*—With reference to Notice in 1881, on the light-vessel at Demerara river entrance being in 14¼ feet at low water, in (approximately) lat. 6° 56′ 10″ N., long. 58° 7′ 40″ W. Information has been received that the light-vessel is moored in 16½ feet at low water spring tides, in lat. 6° 56′ 50″ N., long. 58° 7′ W. *Variation*, 1° *E.*

110.—United States.—*Maryland.*—*Lighthouse off Sharp Island.*—A *fixed white* light is now exhibited from the lighthouse recently constructed off Sharp island, entrance to Choptank river: it lights the entire horizon; elevation 55 feet above mean low water; and visible 12¾ miles. The structure is an iron tower, resting on a caisson filled with concrete, which stands in 10½ feet water at low tide. The tower and caisson are black; the lantern red. The approximate position of the lighthouse is lat. 38° 38′ 25″ N., long. 76° 22′ 27″ W.

111.—United States.—*Connecticut.*—*Stamford Harbour.*—

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Lighthouse and Fog-Bell on Harbour Ledge.—A *fixed red* light is now exhibited from the lighthouse recently constructed on Harbour ledge, Stamford harbour; it lights the entire horizon; elevation, 60 feet above mean low water; and visible 13 miles. The structure is an iron tower, in the form of a frustum of a cone, standing on an iron pier filled with concrete. The tower is red, but will be changed to white in the spring. A fog-bell, struck by machinery, will be sounded at intervals of 20 seconds during thick and foggy weather.

112.—CANADA.—*Nova Scotia.—S.E. Coast.—Light on Jedore Rock.*—With reference to Notice No. 37, p. 72, a light is now exhibited from a lighthouse erected on Jedore (Jeddore) rock, off the entrance to Jedore harbour, about 22 miles eastward of Halifax harbour. It is a *fixed red* light, elevated 86 feet above high water and visible from a distance of 12 miles. The lighthouse, 50 feet high, consists of a square tower, constructed of wood and painted white, with keeper's dwelling attached. Position, lat. 44° 39′ 45″ N., long. 63° 0′ 20″ W.

OUR OFFICIAL LOG.

OFFICIAL INQUIRIES AT HOME, 1882.

1228. *Hilarion*, barque; *Odin*, s.s.; the former built at Shoreham, 1869; owned by Mrs. A. H. Hillier; tonnage, 139; London to South Coast of Africa; general cargo; the latter built at Stockholm, 1873; tonnage, 602; Skutskar to London; iron and deals; in collision in the River Thames, December 18, 1881, when the barque foundered, and two lives were lost. Inquiry held at Greenwich, January 18, 1882, before Balguy, Judge; Grant, Vaux, and Anderson, N.A. Master and pilot of the *Odin* to blame in neglecting to alter the helm and stop, and reverse full speed when the barque was reported ahead.

1230. *Henry Scholefield*, s.s.; built at Sunderland, 1872; owned by Mr. H. Craven; tonnage, 622; London to Whitehaven; water ballast; lost at Netherton, near St. Bees, December 24,

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1881. Inquiry held at Liverpool, January 14, 1882, before Raffles, Judge; Beasley and Murdoch, N.A. Casualty caused by the ship having been steered too easterly a course after rounding the Skerries. Master's certificate not dealt with.

1233. *Strathspey*, s.s.; built at Paisley; owned by Mr. A. M. Hay; tonnage, 105; Dublin to Millom, Cumberland; water ballast; stranded off Seascale, Cumberland, December 24, 1881. Inquiry held at Liverpool, January 17, 1882, before Raffles, Judge; Beasley and Murdoch, N.A. Stranding caused by want of due care and attention to the navigation of the vessel by the master. Certificate suspended for three months.

1234. *Celtic*, s.s.; built at Paisley, 1874; owned by Mr. Wm. Mann and others; tonnage, 95; Barrow to Liverpool; iron ore; abandoned at sea in a sinking condition, December 21, 1881. Inquiry held at Glasgow, January 18, 1882, before Mathieson and Hannay, Justices; Castle and Curling N.A. Cause of leakage not ascertained. Abandonment justifiable.

1236. *Calliope*, s.s.; built at Waterford, 1861; owned by Mr. T. Baker; tonnage, 1,062; Odessa to Bremerhaven; barley; foundered at sea off coast of Portugal, October 20, 1881, only one man being saved. Inquiry held at Cardiff, January 13, 1882, before Rothery, Wreck Commissioner; Forster and Castle, N.A. Loss due to vessel being overladen, and having insufficient shifting-boards. Owner ordered to pay £100 towards expenses.

1237. *Pampero*, barque; built at Liverpool, 1864; owned by Swansea Merchant Shipowners Company; tonnage, 588; Liverpool to New Zealand; general cargo; suffered material damage and put back from sea, with loss of two of her crew, November 23, 1881. Inquiry held at Swansea, January 11, 1882, before Rothery, Wreck Commissioner; Powell, Curling and Kennedy, N.A. Damage due partly to vessel being overladen and partly to the conduct of the master in remaining below in a state of intoxication when he should have been on deck. Master's certificate cancelled, recommended for one as mate. Owners ordered to pay £100.

1238. *Jackal*, s.s.; built at Preston, 1881; owned by Hitchins Bros.; tonnage, 78; Preston to Port Natal, supposed to have

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foundered at sea, November 27, 1881. Inquiry held at Bristol, January 20, 1882, before Rothery, Wreck Commissioner; Pickard and Hallett, N.A. No evidence to show from what cause the vessel foundered. Owner ordered to pay £100 for allowing her to proceed to sea in an unfit state.

1239. *Hospodar*, ship; built at St. John's, N.B., 1874; owned by Mr. G. T. Soley and others; tonnage, 1,549; Bombay to Liverpool, *viâ* Bremerhaven; cotton, &c.; stranded and lost at Calandstoog, Holland, December 6, 1881. Inquiry held at Liverpool, January 25, 1882, before Raffles, Judge; Harland and Anderson, N.A. Loss occasioned by the ship having been kept too long on the starboard-tack towards the land. Master acquitted of default.

1240. *R. M. Hunton*, s.s.; built at Whitby, 1872; owned by Mr. T. Turnbull; tonnage, 618; Alexandria to Bristol; cotton seed; stranded and subsequently foundered near Cockburn Rock, Bristol Channel, January 7, 1882. Inquiry held at Middlesbrough, January 25, 1882, before Coleman, Judge; Parfitt and Comyn, R.N. Casualty due to vessel driving from her anchorage on to the Cockburn Rock. Master's certificate not dealt with.

1241. *Ada*, yawl; and *Young Alfred*, ketch; both fishing vessels engaged on a fishing cruise; tonnage, 81 and 46 respectively; in collision off the Dogger Bank, December 12, 1881, whereby the *Young Alfred* foundered. Inquiry held at Hull, January 24, 1882; before Twiss, Judge; Kennedy and Methven, N.A. Accident due to negligent navigation on the part of the master of the *Ada*.

1246. *Michael Angelo*, barque; built on the Clyde, 1865; owned by Mr. G. Lidgett; tonnage, 1,174; Newcastle to Valparaiso; coals; supposed to have founded at sea. Inquiry held at Westminster, January 25, 1882; before Rothery, Wreck Commissioner; Forster and White, N.A. No evidence as to cause of loss.

1247. *Bath City*, s.s.; built at Stockton-on-Tees, 1880; owned by Mr. C. Hill and others; tonnage, 1,121; Bristol to New York; general cargo. Abandoned and foundered at sea, December 2, 1881, when loss of life ensued. Inquiry held at Bristol, January 18, 1882, before Rothery, Wreck Commissioner; Knox, Parfitt, Eames,

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and Parish, N.A. Loss due to vessel having been too deeply laden for the time of year, and encountering a succession of exceptionally heavy gales, which caused her to spring a leak. Abandonment justifiable.

1250. *Margaret Boyd*, brigantine; built at Biddeford, U.S., 1854; owned by Mr. H. Boyd; tonnage, 395; Miramichi to Larne; deals, &c; abandoned at sea, November 27, 1881. Inquiry held at Ardrossan, January 30, 1882; before Bailey and Mack, Justices; Wilson and Rees, N.A. Vessel having become water-logged in hurricane, master justified in abandoning her.

1252. *Unity*, *Main*, and *F. T. Barry*, s.s.; the two former barges, lying at anchor; the latter built at Middlesborough, 1872; owned by Mr. J. Dixon the younger; tonnage, 545; London to Penarth; ballast; collided with above barges in Fiddler's Reach, River Thames, October 23, 1882, when one man was drowned. Inquiry held at Westminster, January 27, 1882, before Rothery, Wreck Commissioner; Powell, Ronaldson and Hight, N.A. Collision caused by the negligent navigation of the pilot in charge of *F. T. Barry*, in proceeding at too great a speed in thick weather.

1253. *Olga Elkan*; schooner; built at Portmadoc, in 1877; owned by Mr. D. Griffith and another; tonnage, 130; Hamburg to Runcorn; manure salt; lost near Cuxhaven, November 25, 1881. Inquiry held at Liverpool, February 1, 1882, before Raffles, Judge; Ward and Castle, N.A. Loss due to master improperly starboarding his helm, whereby the vessel was taken off her proper course. Reprimanded.

1255. *Highland Chief*, barque; built at Leith, 1881; owned by Mr. J. S. Crane and another; tonnage, 943; Middlesborough to Adelaide; iron tubing; lost on the rocks off Audrecelles, near Boulogne, December 30, 1881. Inquiry held at Westminster, January 31, 1881, before Rothery, Wreck Commissoner; Vaux and Hyde, N.A. Master and mate both to blame, the former for keeping her too long on a S.E. course, heading for the French coast, and the latter for neglecting to use the lead to verify his position when left in charge of the deck. Certificates suspended for six and three months respectively.

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1256. *Hantoon*, barque; *Rothesay*, s.s.; the former built at Rothsay, 1864; owned by Mr. J. T. Devereux; tonnage, 313; Galatz to Queenstown; maize; the latter built at Jarrow, 1880 owned by the Caledonia Steamship Company; tonnage, 1,381; Cardiff to Port Said; coals; in collision off Coast of Portugal, December 27, 1881, when the *Hantoon* foundered and four of her crew were drowned. Inquiry held at Westminster, February 1, 1882, before Rothery, Wreck Commissioner; Aplin, Foster and Harland, N.A. Collision caused by the helm of the *Rothesay* having been ported instead of starboarded, for which the second mate of the *Rothesay* was responsible.

1257. *Lanarkshire*, s.s.; built at Port Glasgow, 1872; owned by Mr. William Campbell and others; tonnage, 596; Glasgow to Lisbon; coals and general cargo; lost on Codling Bank, January 15, 1882. Inquiry held at Glasgow, January 31, 1882, before M'Culloch and Mowatt, Justices; Hight and Methven, N.A. No blame attached to master and mate.

1258. *Cronstadt*, barque; built at Nova Scotia, 1873; owned by Messrs. W. H. De Wolf; tonnage, 874; Moulmein to Dartmouth, and thence to Rotterdam; lost on North Banjaard Shoal, Holland, January 1, 1882. Inquiry held at Liverpool, February 4, 1882, before Raffles, Judge; Comyn and Kennedy, N.A. Master guilty of error of judgment only. Certificate not dealt with.

1259. *Loch Awe*, s.s.; built at Dundee, 1878; owned by the Dundee Loch Line Shipping Company; tonnage, 554; Burntisland to Aarhuus; coal; abandoned at sea, January 7, 1882. Inquiry held at Dundee, February 4, 1882, before Henderson and Simpson, Judges; Curling and Parish, N.A. Loss due to vessel being overladen.

1260. *Devonia*, s.s.; built at Jarrow, 1880; owned by the Devonia Steamship Company, Limited; tonnage, 908; Bergen to the Tyne; ballast; stranded near Boulmer, Northumberland, December 24, 1881. Inquiry held at North Shields, January 14, 1882, before Spence and Swan, Justices; Ward and Clarke, N.A. Master in default for neglecting the lead. In consequence of good character, certificate not dealt with. Ordered to pay £20.

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Official Inquiries Abroad.

1226. *Nerissa*, s.s. ; stranded on the Island of Tenedos, November 22, 1881 ; Naval Court held at Constantinople, December 15, 1881. Master censured and admonished to be more careful in the future.

1227. *Jane Cory*, s.s. ; stranded on Oland Island, November 26, 1881. Naval Court held at Constantinople. Master exonerated from blame.

1229. *Meg Merrilies*, brigantine ; stranded on Armstrong Point Lava Reef, July 21, 1881. Inquiry held at Levuka, Fiji, September 27, 1881. Loss due to the wind failing, whilst beating out of harbour. Master free from blame.

1231. *Penguin*, s.s. ; took the ground in French Pass, New Zealand, November 17, 1881. Inquiry held at Wellington, November 23, 1881. Master committed an error of judgment. Severely censured.

1232. *England's Glory*, barque ; lost near Bluff Harbour, New Zealand, November 7, 1881. Inquiry held at Invercargill, N.Z., November 14, 1881. Master free from blame.

1235. *Mobile*, s.s. ; stranded on Moselle Bar, Bahamas, December 9, 1881 ; Inquiry held at Alice Town, December 10, 1881. No blame attached to master.

1242. *Howards*, s.s., and *Emma*, brigantine ; in collision at sea, November 15, 1881. Inquiry held at Halifax, Nova Scotia, November 21, 1881. Second mate of steamer to blame. Certificate suspended for six months.

1243. *Udston*, ship ; severely damaged in a heavy gale. Inquiry held at Port Elizabeth, December 1, 1881. Damage due to the tempestuous weather encountered.

1244. *Venice*, s.s. ; stranded near Cape Receiffe, December 3, 1881. Inquiry held at Port Elizabeth, December 7, 1881. Second mate to blame. Certificate suspended for six months.

1245. *Cape of Good Hope*, brigantine ; lost on the bar at Port Beaufort. Inquiry held at Cape Town, December 15, 1881. Master to blame for neglecting to keep a look-out. Certificate suspended for three months.

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1248. *Bolton Abbey*, barque; lost on Pratas Shoal, September 30, 1881. Inquiry held at Hong Kong, October 18, 1881. Master recommended to be more careful in future.

1249. *Rebecca Neilly*, ship; dismasted, November 15, 1881. Naval Court held at Guatanamo, Cuba, January 3, 1882. Casualty caused through a heavy squall, the mast having been previously badly sprung. Master to blame for carrying sail on the mast, and for not making for the nearest port. Certificate suspended for three months.

1251. *Retriever*, schooner; stranded on South Reef, November 15, 1881. Inquiry held at Sydney, November 28, 1881. Master to blame. Reprimanded and cautioned.

1254. *Emmanuele Scicluna*, barque; destroyed by fire whilst loading in Sfax Roads, December 27, 1881. Inquiry held at Valetta, January 22, 1882. Fire caused by spontaneous combustion.

1261. *Minerva*, barque; foundered at sea, January 7, 1882. Naval Court held at Ascension. Loss due to the heavy weather encountered.

Ventilation of Coal Cargoes.—The Board of Trade have written to Lloyd's on the subject of carrying ventilation through the bodies of coal cargoes in disregard of the express recommendations of the Royal Commissioners who reported on the subject in 1876. After reciting the conclusions arrived at by the Royal Commissioners, Mr. Thomas Gray says: "The Board's officers have not as yet taken steps to detain ships having ventilation through the body of coal cargoes, nor to see that means are provided to test the temperature of the cargo, as recommended, but the Board are advised that the time has arrived for taking steps in the matter. The Board will be glad to receive any observations which your Committee may have to offer on the subject of this letter, but more especially on the allegation that ventilation through the body of the cargo, so strongly condemned by the Royal Commissioners, is insisted on by underwriters as a condition of insurance."

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COAL CARGOES.

SOME time since in an article upon the question of the carriage of coal by sea, we adverted to the fact that the Board of Trade had not taken any steps with regard to the recommendations of the Royal Commission of 1876, except in respect of the surface ventilation of coal cargoes with a view to the prevention of explosions. In that paper it was suggested that the legislature has already entrusted the Board with ample powers for dealing with the whole question, and that the time would probably soon come when it would have to be dealt with by the detention, as unseaworthy, of vessels in which the conditions of shipment were such as to cause or facilitate the spontaneous combustion of coal. Within the last few weeks, the Board have communicated with Lloyd's as to the practice still said to obtain among underwriters of requiring ventilation through the body of coal cargoes, and the terms of their communication are such as plainly indicate that they at last contemplate putting their powers in force. In their letter to Lloyd's the Board adverted to the recommendation of the Commissioners as thus summarized by them in their report:—

1. That certain descriptions of coal are intrinsically dangerous for shipment on long voyages.

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2. That the breakage of coal in its transport from the pit to the ship's hold, the shipment of pyritic coal in a wet condition, and, *especially ventilation through the body of coal cargoes*, conduce to spontaneous combustion, even though the coal may not be unfit for conveyance on long voyages.

3. That spontaneous combustion in coal cargoes would be less frequent, if regard were had by shipowners and underwriters to these facts.

4. That when coal is being carried on long voyages the temperature in the various portions of the cargo should be tested periodically by thermometer, and registered in the log.

We think the long hesitation of the Board in taking steps which would lead to the general enforcement of these regulations, is fully accounted for by the fact that through ventilation has been, and is still adopted, because it is believed to be beneficial, and for no other reason whatever. It is a source of much trouble and expense to the shipowner, is of pecuniary advantage to no one but the shipwright who does the work connected with it, and it can only be after all persuasion has failed, and every means of informing shipowners of the real facts of the question have been adopted, that the Board of Trade can take the extreme position involved in stopping ships as unseaworthy, because of arrangements ignorantly made by their owners for ensuring their safety.

It is hardly necessary for us to say much now upon the distinction between the two causes of danger to coal ships—combustion and explosion. The labours of the Royal Commissioners and their report have certainly had the effect of spreading the knowledge that they arise from totally dissimilar causes, are to be guarded against at different periods in the voyage, and call for separate and distinct precautions, of what might almost be described as of opposite characters. It has been said with truth that the complete settlement of this point would in itself have justified the appointment of the Commission. Previous to 1875 the two things were confounded even by Courts of Enquiry, and as a consequence they recommended measures of precaution which were positively sources of danger. The Board of Trade were certainly in the right in stopping for the time all such enquiries.

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The cause of explosions is, that coal gives off as from freshly exposed surfaces, that is when newly hewn, and also as the large lumps break up, an inflammable gas whose chief constituent is *marsh gas*. This, when mixed with atmospheric air in certain proportions, explodes, on the approach to it of a flame or of a body at a high red heat. The proportion of air is large as compared with that of the *marsh gas* in the most highly explosive mixtures. On the question of explosions on board coal-laden ships, the report of the Royal Commission was so distinct and unqualified that the Board of Trade could do nothing else than act upon it as they have done, in ordering the detention of ships attempting to proceed to sea without special provision for surface ventilation. Action on their part would appear to be as necessary in the case of short voyages as of long ones, in fact in any case where battening down hatches is a possible accompaniment of the carriage of coal.

In the latter part of 1880, an inquiry was held at Glasgow, into the cause of the loss of the schooner *Adina*, a coal-laden vessel, which sailed from Glasgow for Exeter, with a cargo of gas coal on the 20th April of that year, and was never heard of after. It was then stated by one of the Board's surveyors at Glasgow, that no action had been taken at that port with regard to the ventilation of coasters, upon which the Wreck Commissioner remarked, that there was quite as much need for precautions of this nature in short, as in long voyages. The *Adina* had no means of ventilation other than a booby hatch, and although her loss was put down as probably due to overloading, the Court were clearly of opinion that there should have been provision for surface ventilation. The recommendation of the Royal Commission runs as follows:—

"That with a view to guard against explosion, free and continuous egress to the open air, independently of the hatchways, should be provided for the explosive gases by means of a system of surface ventilation, which would be effective in all circumstances of weather."

In this connection it may be noticed, that the Royal Commission were not directed to consider the question of explosions in ships with coal cargoes, but simply spontaneous combustion, and

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it is somewhat singular that the only one of their recommendations which has as yet had much practical effect, is one outside the strict purpose of the inquiry. This may account for the fact, that they did not take any means for ascertaining whether all coal is liable to give off explosive gases, and indeed the information collected by them on this branch of the subject is singularly meagre and imperfect, they themselves commencing this part of their report by saying that they give no particulars of explosions at sea, because most of such explosions occur in harbour. They say that "the danger of explosion is much greater in some kinds of coal than in others, and that there is more risk and injury to life from these catastrophes, than from spontaneous combustion, because they occur too suddenly to admit of provision being made for personal safety." They then go on to remark on the precautions to be taken against explosion, and on this point there hardly seems room for difference of opinion.

In looking for information as to the extent to which explosions are more common in connection with some special kinds of coal, we find reference made in the report to the evidence of a Newcastle shipowner, who speaks of "two or three instances on the Tyne" of explosions occurring, in each case within two or three hours of the completion of the loading of the cargo. Eight cases of explosions are referred to in detail in the appendices to the report, of these, five were in cargoes of South Wales coal, one in Northumberland, and two in Durham coal. One of the cases of South Wales coal occurred at Birkenhead, and was referred to by Captain Cawkitt, who had then for twelve years occupied the position of chief surveyor to the Liverpool Underwriters, and speaks of it as the only instance of an explosion which had come under his notice. In March, 1881, the Board of Trade issued an official caution to shipmasters and shipowners, giving particulars of cases of explosions, which had been made the subjects of inquiries. They give particulars of sixteen such cases, and in no less than fifteen of them the coal was South Wales, in the remaining case it was Durham coal. Our monthly lists of official inquiries for last year give particulars of one more explosion case, which also was of South Wales coal. It will thus be seen that in cases of

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explosions which have been made the subject of official inquiry, or of which specific particulars were obtained by the Royal Commission, out of a total of twenty-five no less than twenty-one were in coal from one district (South Wales), three from another (Durham), and one case only of Tyne coal. Three important districts are wholly unrepresented, Scotland, Yorkshire, and the Mersey. As regards the Lancashire and North Wales coal, which forms the bulk of the exportation therefrom, it would appear that the Board of Trade had some of these facts in view, when in 1878, they requested the Inspectors of Mines for Scotland, to give their opinion upon the necessity for the ventilation of cargoes of Scotch coal, and obtained a reply to the effect, that they would not advise any relaxation in the enforcement of rules for the ventilation of cargoes of Scotch coal. Under these circumstances, it would appear that the Board of Trade must go on detaining vessels which lack means of surface ventilation, even in cases of coal which has never yet been known to give off explosive gases on shipboard, so as to be a cause of danger. The recommendation of the Royal Commission is indiscriminating, and until some other inquiry is made of a like thorough character, we suppose it must be acted upon. It remains, however, the fact, that in none of the many official papers published on the subject, is there given any instance of loss of life due to an explosion in a vessel loaded with Scotch, Lancashire, Cumberland, North Wales, or Yorkshire coal. It would appear also from investigation, that the gas is mostly given off from coal within a few days of its shipment. Explosions have, it is true, occurred after longer intervals, but then the compartment in which the coal was carried had been closed for the whole time previous to the explosion. From these considerations, it would appear that the urgent need for surface ventilation is more especially in coal shipped soon after leaving the pit, and for the first week of the voyage. This, we believe, has an important bearing upon the question of fires in coal cargoes, and we shall advert to it again further on.

As to the method for securing surface ventilation, there is, fortunately, little reason for difference of opinion. One eminent

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authority, Mr. Wales, Inspector of Coal Mines, has it is true, stated in evidence his conviction, that nothing short of some mechanical means of producing a current is sufficient for ventilating a ship's hold. Mr. Wales, however, stated that his experience is derived from acquaintance with the ventilation of mines, and it is well known that in the case of a ship in motion, it is much easier to obtain a through current of air than in a building on shore. A cowl ventilator at each end of each hold, so fitted that one can be made an uptake, and the other a downtake, whatever the relation of the ship's course to the wind, will in a steamer be fairly efficient. The best arrangement in a large sailing vessel, is a cowl ventilator at each side, and well out to the sides of the ship, through the topgallant forecastle, and a similar pair through the poop. However the coal may be heaped up amidships, there is always a clear passage at the wings, and by this arrangement a current of air is sent through each wing. It remains to be said, that the under side of the opening of each cowl should be at least as high as the top of the bulwarks, and that there should be a thumb-screw and slot, or some other arrangement, by which the cowl can be secured to the pipe through the deck on which it ships, and also that it can be turned about and secured in its place pointing in any required direction. It is also desirable that some efficient means should be provided of closing the hole, in the event of the cowl being carried away by the sea.

Coming now to the more important part of our subject, the spontaneous combustion of coal cargoes, it must first be observed, that the Royal Commission of 1875, made a very thorough investigation of the whole subject, and as regards the scientific bearing of the question, two of their number, Professor Abel and Dr. Percy, both eminent authorities, contributed a paper in which the *rationale* of spontaneons combustion was most ably exposed. Without following them into details, it may be desirable to summarize what they say on this part of the question. They attribute spontaneous combustion of coal to two distinct causes, the oxidation of iron pyrites and of coal itself. They appear to attach the more importance to the first cause, and remark, that

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"iron pyrites are of almost universal occurrence in coal. The condition in which it exists differs considerably in different kinds of coal, in some it is distributed so as not to be detectable by ordinary inspection, in others it is in form of more or less conspicuous laminæ of a brass yellow colour, occasionally small distinct crystals of cubical form, and bright metallic lustre are observed, and not unfrequently it is found in nodules (known as *brasses*) and layers of considerable dimensions." They then go on to state that pyrites specially are liable to oxidation when moisture is present, and when there is a supply of air. Heat is developed by such oxidation and under conditions favourable to its accumulation, the coal becomes heated to such an extent as to ignite. It was stated in evidence, that formerly much greater pains were taken to clean the coal by picking out the *brasses* than was the case at present (*i.e.*, 1875), and one important witness was disposed to attribute the more frequent losses of late years to the present carelessness in cleaning the coal.

A second cause of fire in coal cargoes is found in the rapid absorption of the oxygen of the atmosphere by porous and finely divided coal. This is accompanied by an increase of temperature, and this again further hastens the oxidation, till finally some of the most finely divided of the coal takes fire. Breakage before and during shipment also favours the absorption of oxygen and hence is a contributory cause of danger. The presence of moisture in the coal rather prevents, than facilitates, spontaneous ignition due to the second cause.

Considering then the causes of spontaneous combustion generally, it may be said to be favoured by the accumulation of masses of small coal, by breakage of the coal in shipment, by the supply of atmospheric air, and in some cases by the presence of moisture in the body of the cargo.

One reason why there have been more cases of spontaneous combustion during the last ten years than previously, is the fact that much more small coal has been exported than was formerly the case. The coal famine of about ten years ago led to the use and exportation of such coal as was formerly considered not to be worth the expense of shipment, and the practice has continued.

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Among the kinds of coal which are in their nature unfit to be carried for long voyages is certainly included that which has large quantities of slack in it. Even in cargoes containing a fair percentage of large, there is, however, a liability to accumulations of small coal owing to the methods of shipment. It has often been remarked that even in the good old times when coal was screened as it went into the tip, the great fall and consequent breakage caused the coal to turn out small. The Royal Commissioners took much pains to obtain information as to methods of shipment, and came to the conclusion that every method by which the coal was shot down into the ship caused the small to accumulate just below each hatch, while the large lumps rolled into the sides and ends of the ship. This distribution is further increased by the trimmers, who find it easier to move out the large lumps and consequently do so. Evidence collected by the Royal Commissioners and accounts of casualties that have occurred since, show that nearly all cases of fire originate under the hatchways and thus bear out this view.

There does not appear to be any satisfactory way of shipping coal for long voyages other than by hand, either by baskets or barrows, and these methods are frequently insisted upon by the shippers of the coal for the reason that the extra expense is amply repaid by the better condition in which it comes out at the end of the voyage. One objection to loading by hand is the time occupied, but perhaps that is made too much of, when it is considered that the danger is in *long* voyages, that is necessarily, in sailing ships ; and large sailing ships such as carry coal round Cape Horn or the Cape of Good Hope usually, for other reasons, spend so large a time in England, that a week or two can without very much loss be devoted to loading.

One of the most valuable results of the Inquiry in 1875, was the establishment of the fact that it is futile to attempt to keep coal cargoes cool by any system of through ventilation, while the result of such ventilation really is to facilitate the oxidation either of iron pyrites in wet coal, or of porous and small in dry coal, and thus to actually bring about the very evil it is intended to prevent. As we stated at the outset the Board of Trade have hesitated to detain, as

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unseaworthy, vessels having this through ventilation, but they have taken pains to make known the recommendations of the Royal Commissioners, and are now consulting with Lloyd's, and would appear to be contemplating more direct action in the future. The common method of through ventilation (very common a few years ago) is by means of vertical shafts with venetian battened sides, placed in each hatchway, and extending from the bottom of the ship, sometimes to a foot below the hatch, sometime through and a few feet above it. In connection with these a fore and aft trunk is formed along the sides of the keelson by deals or battens, and large lumps of coal are placed next it. The trunk in each hatch is admirably adapted for bringing atmospheric air into just the place where it can do most harm, that is in the middle of the mass of small coal below the hatchway. A further and still more injurious development of this system is found in ships which carry coal out to the West Coast of South America and bring guano home. A platform is laid for the guano, the upright trunks in the hatches are carried down through the platform, and thus a constant supply of fresh air is provided for the space under the platform and consequently through the seams in it, to the body of the coal.

Another system of through ventilation is formed by shifting-boards placed on both sides of the stanchions in the hold, the joints being open so far as to let air but not coal through. The upper part of the trunk in each hatch is carefully covered during the shipment of the cargo, and the covers are afterwards removed to allow the circulation of air. We refer, in this connection, to a typical case, where the carefully-prepared dangerous provision was completely successful in causing the loss of the ship, other favouring conditions being also present. The loss was the subject of an inquiry, which was held at Valparaiso in December last. The *Delaware*, of 349 tons, sailed from Swansea on August 23rd, with a cargo of smelting coal, was found to be on fire on the 25th November, and abandoned the next day. The Court ascertained that the first portion of the cargo was taken in on a wet day, and the coal was small and caked from damp. There appears to have been about as dangerously efficient a system of through ventila-

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tion as could well be devised, "planks on each side of the stanchions forming a trunk-way fore and aft to the bottom of the ship, and ventilators on the fore and after hatches, reaching to the surface of the coal." The Court, however, contented themselves with expressing an opinion that all coal-laden vessels should be furnished with force pumps and appropriate hose, so that the coal might be cooled, and a pit dug down to the fire. Evidently the gentlemen composing the Court were not so well read in the Report of the Royal Commission as to be aware of the fact that if the trunk had been left out, and if the coal had not been so small and so damp, there would in all probability have been no need for the pumps and hose.

While thus we believe that theory and recorded facts both prove that ventilation through the body of coal cargoes is a source of danger, and that Venetian and trunk ventilators must somehow be got rid of, we cannot conceal from ourselves the fact that, besides them, there are also frequently undesigned and unsuspected means of through ventilation.

For instance, it is very common in large sailing ships to have coal ventilators to the chain trunk, and to the trunk enclosing the pumps, an upper board being left out so that the cowls may be used for surface ventilation. Sometimes a windsail is carried into the trunk for the same purpose. Is is not extremely likely that by these means a strong current of air is carried to the limbers, and so through the seams in the ceiling to the cargo? There are other obvious ways in which surface ventilators may supply air which finds its way into the body of the cargo. These considerations are put forward as showing the desirability of still farther inquiry into the causes of spontaneous ignition of coal. It by no means follows that if it be shown that surface ventilators contribute to through ventilation they should be abandoned, but rather that they should be properly placed, and judiciously used. It appears from what is known on the subject, that the danger of explosion is in the first week of the voyage, and particulars got together by the Royal Commissioners, go to show that spontaneous combustion is usually an affair of months. It may turn out that the wisest means of

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providing against both dangers, is to use surface ventilators only for the first part of the voyage.

There can, however, be no doubt as to the expediency of ship-masters having some means of testing the temperature of the coal by means of the thermometer, and recording it in the log. Spontaneous combustion, it should be remembered, follows only upon preparatory heating, and if the heating be found out before actual fire has broken out the chance of stopping it is much greater. To dig down into the body of a coal cargo, even when it is hot, is a much easier matter than to do so when there is actual fire sending up volumes of suffocating smoke and gas. The temperature of the coal in the body of the cargo and not merely at the top or ends, must, however, be ascertained. We quote the recommendation of the Commissioners on this point:—

"*Provision for testing temperature* of coal cargoes.—The papers forwarded from Nova Scotia by Mr. Poole, the Inspector of Mines, to which allusion has already been made, advocates the use of thermometers, to be lowered, by means of metal tubes, passing into the body of the coal, in order to test and register its temperature; and by this means some interesting statistics, which he encloses, in connection with the heating of coal in store, were obtained. Mr. Wright, the Engineer-in-Chief to the Admiralty, described to us, in his evidence, a similar plan adopted by the Government in their coal stores at Jamaica, and in the coal bunkers of Her Majesty's ships."

"DERELICT."

THE subject of the present paper, though not perhaps a very pleasant one for the seafarer to dwell upon, as in all probability for one crew of a derelict ship brought in many are lost altogether, yet the history of the subject may be interesting, the more so, if we can, by looking at the history, arrive at right conclusions as to the rights over and property in ships and goods rescued from such a condition.

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Possibly from the greater facilities given at the present time for acquiring information from distant parts of the world, but more probably from the effect of sec. 183 of the Merchant Shipping Act, 1854, which repealed, so far as this country is concerned, the General Maritime Law "That Freight is the Mother of Wages," cases not only of abandonment and of subsequent recovery of vessels, but of the latter relatively to the former, seem to be more frequent now than in former days. When a man knew that the act of abandoning his ship carried with it at the best a return to port as a penniless pauper, and that a protracted voyage under jury masts had at all events the pleasant compensation of "more days, more dollars" in store, his efforts were likely to be more energetic than when, in a partially dismasted ship making water, he now is met by a mail steamer which is willing to take him home in a few days, but will not stop by to see how he gets on. In the latter case, if he knows his owners to be solvent, there is but the pleasant interlude of a few days' holiday on board the steamer, then wages for the time served, a possible detention by the Board of Trade to give evidence and compensation for so doing, and then a fresh start in another ship. In the former case, a certainty of hard and dangerous work, and an uncertainty about ever reaching port at all.

Even the officers, though actuated no doubt by a high sense of duty to their employers, may yet be aware that those employers will not suffer any very severe pecuniary loss from the non arrival of the vessel, and are actuated, as indeed who would not be, by the same considerations to some extent as those operating on the minds of the simple seaman, to say nothing of the fact that if the crew abandon the vessel, the refusal of the officers to go too would probably be an act of suicide. If then for any reason the cases of derelict have become and are still becoming more frequent, it is certainly desirable that those most interested, *i.e.*, the owners of the ship, goods, and freight, and their insurers, and also the salvors should clearly understand their relative rights.

Now, in the first instance, it is important to ascertain precisely what is a "derelict" in contemplation of law, for not every vessel deserted by her crew is a "derelict" in the legal sense, or to put

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the matter in another way, not every derelict *de facto* is a derelict *de jure*, as, *e.g.*, if immediately a collision has happened the crew of one vessel in sudden fear of their vessel sinking, jump on board the other, such an act of itself would not constitute the vessel a derelict. (The *Fenix*, Swabey, 13; the *Cosmopolitan*, 6 Notes of Cases, Supp. XVII.) So if the crew of a small vessel left her at anchor in a place unknown to them, and went on shore to ascertain their position, intending to return when they had found it out, such vessel would not be a derelict (the *Hercule*, 8 Irish Jurist, 412); nor if the crew of a vessel in a position of danger left her for the purpose of getting assistance (the *Atlas*, 1 Lush, 521); but if their primary object in leaving the ship was to save their lives, an ulterior intention of sending a steamer to try and save the ship if still in existence would not prevent the vessel so left being a derelict (the *Coromandel*, Swabey, 205). Perhaps the best distinction which can be drawn is that deduced by Dr. Browne from the civil law, that to make a derelict the abandonment must be not merely *sine spe recuperandi*, for that hope probably does not exist at the time of the peril of collision, but *sine animo revertendi*, that is, that the deliberate intention of the persons is not to return, (Brown, "Cir. and Adm. Law," Vol. II., p. 51.) Probably as "Hope springs eternal in the human breast," if the first test were applied at any time after the crews were in comparative safety, there would be no derelicts at all, whereas the latter is one which can be judged of without difficulty from the surrounding circumstances at the time of the abandonment.

The next question is one of more difficulty, namely, what are the respective rights of the original owners of ships, cargo and freight, of the salvors, and of the Crown, or those claiming by grant from the Crown.

It appears, *primâ facie*, that the finder of property which has no owner becomes himself the owner, so also the finder of property thrown away, but not of that lost by accident (Stephen Comm., Vol. I., p. 160). Now, as regards the shipowner, as distinguished from his servants, the master and crew of the ship, there can be little doubt that the vessel is lost by accident, and there can be equally little doubt that he or his insurers have the *animus* or

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intention of reclaiming the property should it ever come to hand, however small may be their *spes* or expectations of ever doing so, and therefore it would appear that the right still remains in them, whatever rights others may have, unless they, after knowing of its preservation, take no steps to recover their property. (See Molloy de Jur. Nav., 267.)

So far as regards derelict found in or on the coast of Great Britain this right is expressly recognised by the provisions of the Merchant Shipping Act, as "derelict found in or on the shores of the sea or any tidal water," and is by sec. 2 of the Merchant Shipping Act, 1854, included in the general term "wreck." The property of the "owner" therein is recognised by sec. 450 of the same Act which allows him to hold possession, only giving notice to the Receiver of Wreck of such possession, for the purpose presumably of letting anyone else who may claim under an adverse title know of such finding. Whereas if anyone else finds such "wreck" he is bound under heavy penalties [sec. 450 (4)] to surrender it to the Receiver of Wreck, who is by that Act appointed to have charge of all wreck as the delegate of the Board of Trade, which Board on the first vacancy in the office of Receiver-General of Droits by the Admiralty, was to take over his functions (Merchant Shipping Repeal Act, 1854, sec. 10), thereby giving to the same department whatever rights the Crown or the Admiral (Merchant Shipping Act, 1854, sec. 440) might have over wreck, as custodian for the rightful owner, though their distinctive rights of *property* are still carefully preserved (secs. 454, 471, 472, 474). If the derelict is "found at sea" the Court of Admiralty has "jurisdiction to decide on all claims whatsoever relating to salvage" of it (sec. 476), and it is only in cases where no owner appears within the time stipulated by the Act that the right of the Crown or of the Admiral or Lord of the Manor comes into existence as a right of property. This right appears to be in its nature akin to that of the Crown to Treasure Trove (5 Coke 108, 3 Inst., 132) of the Lord of the Manor to estray (Britt. Ca., 17 Bend., pl. 27) and of the Crown to the property of persons who die intestate and without any kin, *i.e.*, that property without an owner belongs to the Crown or its grantee *jure coronæ*. Not that the mere fact of goods

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being found without any apparent owner vests any property in the Crown; pending the appearance of the owner, the Crown or its grantee only holds the property in trust for the owner and to guard its own reversionary interest in case no owner appears. This rule is not the product of modern legislation, but appears with more or less distinctness in almost all the codes of Maritime Law as contrasted with Feudal Customs of the middle ages. It will probably be sufficient to establish this if a quotation be made from one of the better known codes. Thus we find in Sir Travers Twiss' edition of the Black Book of the Admiralty the following curious example :— "Likewise a shyp on entering into a haven or elsewhere, by chaunce breaketh up and perysseth, and the mayster mariners and marchants dye, theyr goods are cast on the coast, or remayne in the sea, without any pursuyte on the part of those *to whom they belong*, because they know nothynge ; in such a case, the whiche is very piteouse, the lord ought to set persons to save the said goodes, and those goodes the lord ought to guard and place safely, and afterwards he ought to make known to the relatives of the dead drowned the misfortune and paye the said salvors after the labour and pain that they shall have taken, not at his own expense but at the expense of the thynges saved, and the residue the which remayneth the said lord ought to guard, or have guarded entirely till a yere, unless those to whom the said goodes *belonge* come sooner. And the end of a yere passed or more, yf it pleaseth the said lord to wayte, he ought to sell publicly, to the highest offrer, the said thynges, and from the money received he ought to have prayer made to God for the dead, or to marry poor maydes, or to do other workes of mercy after reason and conscience. And yf the said lorde taketh of the thynges a fourth or other part he shall incur the malediction of our Mother Holy Church and the penalties above said withoute ever having remission if he make not satisfaction. This is the judgment." (Black Book of Ad., Vol. II., p. 465. Rolle of Olayron.)

No doubt it frequently happened in the "good old days," that the prince or feudal lord or other grantee of the Royal Franchise (Coke I. Inst., sec. 440, note), had neither a proper fear of the terrors of the Mother Church, nor a proper regard for the

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matrimonial interests of poor maidens, thinking perhaps that the latter were sufficiently guarded by that other notorious right, or wrong, the *droit de seigneur*, and that he did not even give all facilities to a merchant or shipowner who proposed to come into his district to claim his goods or ship, and there being no public press either to advertise the loss or the finding, still less to give expression to any public opinion likely to arise on the question of annexation by the lord, and that from these causes a practice of assuming that the property itself, and not merely the duty of protecting it vested at once in the Crown or its grantee, though the very word—*droit*—used down to the present time to express the rights of the Crown, or of its grantee, the Lord High Admiral, does not by any means convey the idea of absolute property (see "Termes de la Ley," p. 163). If indeed the property were vested in the Crown at once, a question would frequently arise, where the derelict was found by a vessel of one nation and brought into a port of another, as to which Crown the property vested in; the salvors, when they took possession would, it is to be presumed, acquire the property for their own sovereign, and it is difficult to see how property so acquired on the high seas should divest, when it, now no longer derelict, is brought by the salvors into the territory of a State in amity with their own. It can only be on some principle of unregenerate human nature which regards every stranger as an enemy, and his goods as forfeit, that such a claim can be based, and even on that assumption, the property of an enemy only vests in the captor after condemnation, *i.e.*, goods taken from the enemy without a commission for the purpose, are *condemned* as droits of the Admiralty, after giving opportunity for every *bonâ fide* claimant, not disentitled by reason of being an enemy, to appear and claim them.

A curious illustration of the process by which the reform of such a practice of appropriation is ameliorated by Christianity and its accompanying culture, is afforded in the history of the earlier civilization of the Roman Empire. In the infancy of that civilization and amongst the people of almost the first maritime nation whose laws have come down to us, in the shape of the so-called Rhodian Law, in all cases of wreck, whether the crew were saved

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or not, the ship and goods became the property of him on whose lands they were cast. But the Emperor Constantine the Great, directly gave up any such claim in declaring in such a case "Let the owner have it, and let not my Exchequer meddle with it, for what right hath my Exchequer in another man's calamity, so that it should hunt after gain in such a woful case as this?" That noble sentiment, incorporated in the Civil Law (Leg. I., Lib. II. de Naufragus) as in the breasts of Christians, could never have been abrogated or repealed save by the cupidity and wickedness of individuals, and only so long as such cupidity and wickedness remained unchecked by sense of duty, human law, or the irresistible force of public opinion.

And so we find, coming to the history of our own nation, the sovereign little by little yielding as if of his own bounty, and compelling his subjects to surrender, a portion of that *Droit*, which in the earlier interpretation was no right but a usurpation.

Thus after the Rhodian Law had been revived, as in the case of the *Droit de Bris* in Normandy, the last so called Droit giving, to the lord of a place where any shipwreck took place, whether the crew were saved or not, one-third or one-fourth of the goods saved, another one-third or one-fourth to the so-called salvors, who, in point of fact, were generally wreckers, and the residue only to the owners—we find the laws of Oleron, first in the XXV. and XXVI. Articles ordering the heaviest retribution possible against the wrecker and his lord, the first to be hanged on a high gibbet near the place of the wreck, and the lord to be burnt alive in his castle and both to be accursed and excommunicated, and then the XXIX. Article ordering that the lord shall have no share of wrecked goods as a right, but shall only with his servants be entitled to a just remuneration for salvage services actually rendered when any human being escapes to shore.

Then we find in 1272 the principle extended by Statute to the case where a dog or cat has escaped alive, and this extension held (2 Inst., 168) to obtain not only in the case of a dog or cat, but of any domestic animal or fowl.

Then in 1353, we have a declaration that goods washed ashore from a vessel wrecked on outlying sea banks is not wreck within the

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meaning of the Sovereign's and his grantee's privilege (27 Ed. III., stat. 2, c. xiii.), if identified by the original owner. Again, in 1452, means provided for enabling aliens whose goods or ships have been wrongfully seized on sea or in port, to recover the same (31 Hen. XI., chap. iv.); in 1713, power given to justices of the peace and Custom-house officers to require the assistance of ships and boats in the neighbourhood to prevent vessels in distress becoming wreck (12 Ann, stat. 2, c. xviii.); in 1753, the punishment of wreckers extended to those who took away goods from any vessel, whether any living thing remained on board or not, and therefore including derelicts (26 Geo. II., c. xix.), and so on until the Merchant Shipping Act, 1854 (sec. 474), gave the Crown, in the person of the Receiver of Wreck, the right to purchase all grants of wreck heretofore made to any subject. To what extent this right has been exercised is not at present important, because in consequence of the limitations of those rights by the successive enactments already referred to, and increase in the duties attendant upon their exercise, it is probable that those in possession of the rights would be only too glad to give up both the right itself and the corresponding duty to the Receiver of Wreck without remuneration; but it simplifies the question of derelicts, as the only person to be considered by the salvor of derelicts is the Receiver of Wreck, and subsequently the Marshal of the Admiralty Court, so far as any droits are concerned.

Having shown, I think, that the rights of the Crown are those primarily of guardian only for an unknown owner, and ultimately, in case no owner appears, of universal heir, it remains to be considered how the respective rights of the owner of the ship and owner of the cargo are affected. Those rights are primarily regulated by the contract of affreightment contained in the bill of lading or charter-party, or both, entered into between the ship-owner and cargo-owner, or their respective agents; and if one party breaks the contract, he is liable to be compelled to perform it, or to pay damages for the breach, unless he can show that he has been prevented by some of the excepted causes mentioned in the contract of affreightment.

Now, when the crew abandon a ship, if their act in so

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doing is premature, they have not been prevented by the ordinary excepted perils of the sea from performing their contract, and therefore there is a breach of the contract for which they are liable in damages. If, however, the abandonment was justifiable by reason of the excepted perils, it is clear that no action could be brought on the contract. But this does not settle what are the relative positions of shipowner and carrier when the ship with the cargo on board reaches a port of refuge in charge of salvors.

It is clear that whether the abandonment of the vessel was justifiable or not, the master, as agent for shipowner has, so far as he can, abandoned the contract to carry, and that therefore the owner of the cargo is justified, should he so desire, in treating it as abandoned, and in claiming his goods from the guardian of them *pro tempore*, irrespective of the shipowner. This point has indeed been recently decided in the Court of Appeal (the *Cito*, 45, L. T. Rep. N. S., 663) in a case in which the owner of the cargo appeared and claimed it at a port of refuge before the owner of the ship had regained possession. But it does not appear to have been decided as yet whether the shipowner in such a case would have a right to deliver the cargo at the port of refuge.

For example, in the case of the *Cito*, the voyage was from the United States to Holland, and the cargo one which would not damage by delay, the abandonment was only a short distance from the American coast and the port of refuge an English one. Under these circumstances naturally the shipowner was desirous of carrying the cargo for the short remaining distance and earning the whole freight; the cargo-owner, on the other hand, was desirous of having his cargo at Falmouth, and paying nothing for its carriage, except indirectly to the salvors, and the Court of Appeal held that, under the circumstances, he was entitled to treat the contract as abandoned by the shipowner, and to have his cargo free of freight. If, however, the port of refuge had been on the other side of the Atlantic the desires of the parties would probably have been reversed, and the shipowner would have wished to abandon the contract altogether, the cargo-owner to have his cargo forwarded at the original rate, without expenses

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attendant on unlading and re-stowing, &c. And in the absence of authority to the contrary it would appear that he is so entitled, that in fact the abandonment of the ship by the crew and subsequent salvage gives the owner of the cargo the option of either abandoning the contract also and taking his goods wherever the ship may come, or holding the shipowner to the completion of a contract now possible or to pay damages for the breach of it.

The question whether the shipowner has recovered possession of his ship or not before the owner of the cargo appears, can make no difference to the rights of the parties if the contract is to be completed, but may affect them in the case where the cargo-owner is desirous of treating it as abandoned. In such a case it would seem that the shipowner may say with justice that he is in a position to fulfil his contract, and indeed is bound to fulfil it, there being no longer the excuse of the excepted perils (the *Cargo ex Galam*, Br. and Lush, 167; the *Teutonia*, L. R. 4 P. C. 182); and this view is supported by the state of the law in cases where a ship after being captured, and the contract of affreightment abandoned, is subsequently rescued by the crew, or released by the Prize Court, and the voyage completed as in such a case the contract of affreightment is revived by the repossession of the shipowner (Wheaton "Maritime Captures," p. 255; Maclaclan "Merchant Ships," 2nd Ed., 458; "Maude and Pollock," 4th Ed., 377). To sum up, the act of abandonment makes the contract of affreightment voidable at the option of the cargo-owner alone at any time before the shipowner recovers possession, but this option is lost by the shipowner recovering possession.

THE STORMS OF 1881.

FEW years have been marked by so many shipping disasters on the coast of the British Islands as 1881. Both at the commencement and at the end of the year gales of unusual violence occurred, and, especially towards the close, gale followed gale with such remarkable rapidity and with such disastrous effects to shipping that a

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mere list of the storms which occurred would probably not be without interest; but it is hoped that by adding a few details in connection with some of the most important storms light may be thrown upon what to many must appear little short of a complete chaos.

Before dealing with the various storms it may perhaps be advantageous to refer in the broadest possible manner to a few features common to the passage and conditions of gales in the vicinity of the British Islands; all such remarks will apply with equal force to the North Atlantic in the track of trans-Atlantic steamers.

It is an almost invariable rule that storms travel to our Islands from the Atlantic in a north-easterly direction, and before reaching our shores they often traverse a considerable portion of the ocean, but very little is known as to how far they travel or the manner in which they are formed.

At certain seasons of the year permanent areas of high barometric pressure exist in different parts of the temperate zone, and these give a permanent character to other meteorological elements, but besides these, we have at all seasons temporary areas of high barometric pressure, which often locate themselves persistently in the same position for weeks together. Such conditions are called anti-cyclonic, a term first used by Mr. Francis Galton, in his "Meteorographica," published in 1863.

The positions of these anti-cyclones, or areas of high barometer readings, determine to a very great extent the paths of storms, for areas of low barometric pressure, in the immediate neighbourhood of which, broadly speaking, storms generally exist, do not override the areas of high barometer readings, but skirt round them, and in our latitudes show a decided preference for skirting the northern side of such areas. The persistency with which these areas of high barometer having once occupied certain positions, continue to hold them, is an explanation of the marked similarity in the track of storms which occurs at times for a period extending over several weeks. Each successive depression (or storm) as it speeds on its course to the eastward or north-eastward, is deflected more or less to the northward as it meets with

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a barrier in the shape of an area of high barometer. So that when, for example, the region which embraces the British Islands is brought under the influence of an area of high barometer, storm-centres approaching us from the Atlantic cannot pass over us, but are fended off to the northward. On the other hand, when this area of high barometer is situated some distance to the south of our islands, say over the south of France or Germany, then storm-centres can freely pass over us. Knowing the tendency there is for an anti-cyclone once having located itself in a certain position, to maintain that position for a considerable time, it is possible on the first appearance of an anti-cyclone, to reckon with a fair amount of certainty on an almost entire immunity from storms for some time; of course sooner or later, according to the extent of area and conditions under which such anti-cyclones hold, there would be a giving way to the force of some incoming depression, and when the conditions are once thoroughly upset, it is probable that for a considerable period storms will continue to pass over the locality at rather frequent intervals; and, indeed, until anti-cyclonic conditions can again restore themselves. It is this alternation in the holding of the ground which affords an explanation to a very great extent, of the character of weather we experience. Similarly out in the Atlantic, at times the path of storms is much further to the north than at others, according as areas of high barometer exist in one latitude or another.

The foregoing remarks will probably tend to a more complete understanding of the conditions which existed at different periods of the year here dealt with.

JANUARY.—The conditions of the weather over the British Islands were exceptional. The mean temperature for the month was from 9° to 12° below the average of former years over the whole of the United Kingdom, and some of the lowest temperatures on record occurred during the month, readings as low as zero (32° below freezing point) were registered in nearly all districts. Rainfall was deficient, but an unusually large amount of snow fell. The barometer was generally uniform in different parts of the kingdom and as a necessary consequence the winds were for

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the most part light and were generally easterly and northerly in direction. The only disturbance which occurred of any importance was the violent easterly gale of the 18th and 19th. This gale was blowing on the 17th in the Bay of Biscay, and travelled in a north-easterly direction up the English Channel as far as Portsmouth by the evening of the 18th, after which it retreated for some distance and on the morning of the 19th was in the neighbourhood of Jersey; it subsequently crossed France and Germany. The chief force of this gale was felt on the east coast of England on the 18th and the fall of snow which accompanied it was considerable over the greater part of England. The peculiar features of this storm were due to an area of high barometric pressure which was situated over Scandinavia and which would not give way to the incoming storm, but maintained a sharp conflict for the field and compelled the storm to retreat for some distance. It was this holding at bay by high barometric pressure which gave the gale such persistent continuance. The east coast of England was situated in the heart of the struggle throughout the whole of the 18th, the wind blowing somewhat in the direction from the high to the low barometer.

Although the weather in the British islands was quiet generally throughout the month yet reports from trans-Atlantic steamers show that in the North Atlantic storms were unusually frequent and severe. Winds were generally easterly and unfavourable to homeward-bounders throughout the month, although at this time of year the wind is usually south-westerly. The shipping notices show an unusually large number of derelict vessels in the Atlantic.

FEBRUARY.—The weather was still cold over the British Islands, temperatures ranging from 3° to 5° below the mean over Great Britain and from 1° to 2° below the mean over Ireland. The rainfall was large and a considerable quantity of snow fell. The winds during the first half of the month were south-westerly and the only two severe storms during the month occurred at this time. On the 7th and 8th a heavy southerly and westerly gale blew over the whole of the United Kingdom, On the 10th a storm-centre passed over our Islands causing strong southerly and westerly gales in England and Ireland and strong easterly gales in Scotland. The

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centre of this storm had passed to the eastward on the 11th but northerly gales blew generally over England. The winds during the latter half of the month were northerly and easterly and generally quiet.

Over the North Atlantic in the track of trans-Atlantic steamers, the winds were for the most part favourable to homeward-bounders during the first half of the month and favourable to outward-bounders during the latter half. Very few storms occurred, although usually in the North Atlantic, February is one of the worst months in the whole of the year.

MARCH.—The temperature was generally about 2° below the mean in Scotland and in the north of England, but differed little from the mean in other parts of the United Kingdom. The rainfall was everywhere large. The winds over the British Islands were southerly and westerly except at the close of the month, when a spell of easterly winds set in over England. The principal storms occurred on the 2nd to 7th, 18th to 19th, and 24th. The first of these (2nd to 7th) was felt generally over the United Kingdom, although its chief violence was on the coast of Scotland, where 200 lives were lost. This storm was similar in many respects to that which occurred on January 18th, only its centre was further to the northward. Its persistent continuance was due to its being held at bay by an area of high barometric pressure. The fall of snow which accompanied this gale in Scotland was exceptionally severe, it continued without intermission for 70 hours, and in places the drifts reached the depth of 45 feet. The gale of 18th to 19th was chiefly felt at the northern stations, and had a westerly direction. The gale of the 24th was pretty general over the United Kingdom, and blew from the south-westward.

Reports from trans-Atlantic steamers show that in the North Atlantic the winds were generally easterly and unfavourable to homeward-bound vessels. In the middle of the month a very heavy gale blew in mid-Atlantic, and at the commencement of the month winds were stormy on the eastern side, in other respects, the Atlantic weather was pretty quiet.

APRIL.—The weather was generally cold, the thermometer ranging about 4° below the mean over the British Islands; the

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amount of rainfall was everywhere less than usual. The barometer was generally higher in the north than in the south of our Islands, and with these conditions it necessarily follows that easterly winds prevailed. It is however seldom that we have such a continuance of easterly winds as occurred during this month, for they held generally until the 21st, after which the direction was north-westerly. The force was for the most part light, indeed it was only at the commencement of the month, on the 2nd and 3rd, that a storm worth mentioning occurred, and this was only felt in the south of England: its direction was north-easterly.

In the North Atlantic the winds in the track of trans-Atlantic steamers were generally unfavourable to homeward-bounders. At the middle of the month a severe hurricane blew between Bermuda and the American coast.

MAY.—The weather over the British Islands was in fair agreement with the average conditions, more so than in the earlier months of the year. Winds were generally very light. On the 16th, a storm-centre passed across Ireland and the north of England, causing a fresh gale generally.

In the North Atlantic the winds were particularly quiet on the eastern side but less so on the western side. Westerly winds prevailed to a greater extent than of late.

JUNE.—This was a cold month over the whole of the British Islands, and the rainfall was heavy in the west. Winds were very quiet, and the force of a fresh gale was not attained throughout the month. The observations from vessels running between Europe and America show that the weather was similar to that in May.

JULY.—Exceptionally hot weather was experienced in the middle of the month, 97° degrees being recorded at Greenwich in the shade on the 15th, and the thermometer exposed to the sun registered 154°; the barometer was lower in the north than in the south of our Islands throughout the month and depressions were constantly passing from the Atlantic to the northward of us, but winds were generally quiet from the westward, except on the night of the 20th, when a very severe storm passed over the Shetlands, occasioning considerable loss of life and property.

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In the Atlantic the weather was stormy on the western side at the commencement of the month, in other respects it was comparatively quiet.

AUGUST.—In the British Islands the month was both cold and wet and south-westerly to north-westerly winds prevailed. Throughout the month depressions arrived from the Atlantic in quick succession, but they generally skirted our northern coasts; doubtless this affords an explanation of the unsettled weather experienced. On the 26th, a heavy gale passed over Scotland.

Hurricanes were of rather frequent occurrence in the North Atlantic, the one which blew at Savannah on the 27th and which was experienced by many vessels in different parts of its track before and after this date seems to have been exceptionally severe.

SEPTEMBER.—The first part of the month was cold and the latter part fairly warm over the whole of the United Kingdom. The barometer was sometimes highest in the north and at others highest in the south of our Islands. The winds were northerly during the first half of the month and southerly during the latter half, the force being generally light. The only disturbance of any importance was one which passed over us on the 22nd and which caused considerable destruction on the Danish coast. The force of a gale was scarcely attained in the British Islands throughout the month.

Vessels trading in the North Atlantic speak of falling in with several gales, and some on the European side of the Atlantic.

OCTOBER.—This month was exceptionally stormy and the weather over the British Islands was very cold. The temperature for the month was below the average by 5° or 6° over England, and by about 2° or 3° in Scotland and Ireland. Westerly winds prevailed during the first half of the month and easterly during the latter half. A storm-centre came in from the Atlantic and passed on its easterly course to the north of Scotland on the night of 11th to 12th, this caused a gale at the northern and western stations. Another storm followed very closely, for on the evening of the 13th a heavy gale was blowing in the west of our Islands. The centre of this storm passed a little to the south of Edinburgh at 8 a.m., 14th, and crossed the North Sea in the

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course of the day; the greatest amount of damage was done on this day and as far as the sea is concerned the most disastrous effects were off the Berwickshire coast; much of the loss of life here must, however, be attributed to the deceptive character of the weather in the morning which led the fishing fleet to sail from Eyemouth. Little attention could have been paid to the barometer, since at the time the fleet put out to sea it read as low as 28·5 ins., having fallen an inch in about 12 hours. The centre of the disturbance must have passed completely over these fishing vessels. The great destruction done by this gale was probably due to the particularly heavy gusts which were peculiar to it, rather than to any exceptionally violent steady force. At Liverpool, a pressure of 77 lbs. on the square foot was reported, and at Greenwich, a pressure of 56 lbs. on the square foot, such a pressure never having been previously observed since the erection of the anemometer in 1841. The sudden manner in which the wind increased in force, was doubtless due to a storm having but recently passed, so that the front half of the advancing storm was not fully developed; it was in the rear of the storm that the greatest violence was attained. In one day as many as 130 vessels were posted on the Wreck and Casualty Book at Lloyd's, and at Yarmouth the loss in nets among the fishing craft amounted to £10,000. This storm has been traced across the Atlantic (in a paper read at the Meteorological Society, on 16th November, 1881), apparently having been first formed on the 10th, at about 250 miles to the south of Nova Scotia, and although it subsequently increased in energy very rapidly, it did not develope the force of a gale until the 13th, when the centre was about 600 miles to the west of Ireland; at this time there was little or no indication in the British Islands of approaching storm. The maximum strength of the gale was evidently at the time of its passing over our Islands, its rate of progress between the 13th and 14th, was 39 miles per hour. Another heavy gale appeared off the south-west coast of Ireland on the 19th, and hung off our western coasts until the 23rd, causing easterly gales over the greater part of the country. The duration of this gale and the cold wind which blew were due to an area of high barometer readings over Scandinavia, which

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effectually barred the progress of the storm in its easterly course. The weekly wreck returns show that the lives lost and missing were for the four weeks, respectively 60, 138, 673 (a number almost unprecedented in one week), and 150, making a total of 1,021.

Trans-Atlantic steamers show that the weather in the Atlantic was very stormy, especially between the 16th and 23rd.

NOVEMBER.—From the commencement of the month a considerable change took place in the temperature over the British Islands, and this may be considered the commencement of the mild winter which has been experienced. November was warmer than October, over the whole of the United Kingdom. The barometer was comparatively high over France throughout the month, and readings were generally higher in the south of our Islands than in the north. Storm-centres arrived from the Atlantic with great frequency, but they generally passed to the north of us. Winds were mostly from between S. and W., and were comparatively quiet during the first half of the month, except an occasional freshening under the influence of a depression passing to the north of Scotland. The last half of the month was very stormy, and during this period the wind blew with the force of a gale on 13 days out of 16. On the night of the 19th-20th, a short but severe gale blew in the north of Scotland. Another severe gale blew in Scotland and on the western coasts on the 22nd. The gale which blew on the 26th to 28th, was, however, probably the most severe of any during the month; it was during this gale that the Calf Rock Lighthouse was destroyed. This storm was general over the British Islands, and the barometer at the centre read below 28 ins.

The weather over the part of the Atlantic which is traversed by vessels running to and from the United States, was very similar to that experienced in the British Islands, being generally quiet at the commencement of the month, and stormy at the latter part.

DECEMBER.—The weather of this month was more in agreement with the average conditions than of late, and although at times bright warm days were experienced, yet the mean temperature differed but little from that of former years. The winds were

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mostly from between S.W. and N.W., the British Islands being almost throughout the month under the influence of depressions or storm-centres which came in from the Atlantic, and travelled either across our islands, or slightly to the north of us. These storm-centres were, however, of a less important nature than those of October and November, consequently the winds accompanying those were less violent. The principal storms blew on the 7th, 17th, and 20th.

The observations of trans-Atlantic steamers seem to show that the weather out in the Atlantic, was similar to that experienced in the British Islands.

The following shows the number of vessels lost off the coasts of the United Kingdom for the several months in 1881, so far as stated in the published weekly returns. The figures in brackets show the number of weeks for which the returns have been combined to obtain the totals for the month.

Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	YEAR
133	68	115	33	18	16	29	27	25	188	98	95	845
(4)	(4)	(4)	(5)	(4)	(4)	(5)	(4)	(5)	(4)	(4)	(5)	(52)

It will be seen that the largest number in any month was 188, in October. During the first three months of the year the losses amounted to 316, whilst for the last three months they were 381, making a total of 697 for the six winter months, this is 83 per cent. of the total losses during the year.

At the Annual Meeting of the Chamber of Shipping of the United Kingdom recently held (10th February, 1882), Sir Thomas Brassey referring to losses by tempests which could not be provided against, asked whether these losses could not be in any material degree diminished. It seems to the writer that the only possible means by which such a result could be brought about, would be by a more complete knowledge of these tempests, it is hoped shortly to refer more at length to this subject.

The bulk of the information for the foregoing remarks has been obtained from the Daily and Weekly Weather Reports, published by the Meteorological Council. C. H.

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THE DEFENCE OF THE COLONIES.

A GREAT deal of eloquence has recently been heard on the question of a grand federal union between Great Britain and her numerous outlying possessions in various parts of the globe, but none of the speakers ıve hitherto put their ideas in a practical form. If they allude a Customs union, it is simply wasting words to dwell on it; r, annoying as it may be to acknowledge our failure, Free Trade forbidden by colonists from Canada to the Antipodes, and bids ir to have many a struggle before its premises are accepted by e world. On the other hand, if an alliance, defensive and fensive, be alluded to, he must be very sanguine who allows mself to be persuaded that the colonies can ever form a source strength to the mother country; indeed, it is pretty generally lmitted that with many self-interest is the only bond of union. colonist once said to the writer, "We are not very particular hat flag we serve under, so long as we can buy and sell in peace." his man might serve as a typical representative of a large part of e population of our dependencies, who are ever ready to call out r protection from native enemies by Imperial troops and Imperial bsidies, yet are sadly remiss in handing out when called on to ıy a portion of the expenses contracted for their special benefit. Mealies pay fairly, sugar pays well, but war pays best of all," marked a Natal man during the Zulu war; and it may be taken a general exposition of colonial policy. Fortunately, steam has a very great measure lessened the value of these outposts. In rmer days no troopship sailed to India direct; the Cape of Good ope was invariably made a halting-place outward, and St. Helena)meward. The quickest passage to the Cape from England then quired eight or nine weeks, sometimes twelve; it is now per- rmed in eighteen days with far more regularity than could ever ıve been anticipated by the most sanguine of merchant princes. England possesses three species of colonies; first, those purely ilitary in character, which are kept up at a vast expense, and hich offer us outlets for a surplus population, such as Gibraltar,

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Bermuda, and Malta; the second includes British North America, New Zealand, Australia, the East and West Indies, with their smaller dependencies; and, lastly, that child of modern diplomacy, Cyprus. Each will, as far as possible, be reviewed according to their real or supposed importance to the safety of the Empire.

It would be out of place to dwell on their former history, or by what means they came under the British flag; the law of the strong invariably settles the question if a dispute arises. But, as an American remarked not long since, we appear to have a watch-house at the doors of all mankind. The Channel Islands dominate the north coast of France; Heligoland over our formidable neighbour on the Elbe; Cyprus over Greece, Turkey, and Egypt; Malta looks down on Italy on one hand, and the African colonies of France on the other; Gibraltar, like a couching lion, lies watching Spain. Our American cousins complain bitterly of the advantageous positions of Nassau and the Bermudas, and talk loudly of demanding their cession.

As before observed, steam has materially changed the conditions of warfare, and altered the value of strategical points to such a degree that it is questionable if some are worth what is paid to maintain them. At the head of the list of doubtful posts, notwithstanding its admitted strength, stands Gibraltar. When fleets propelled by sails only were occasionally several weeks on the passage between England and the Straits, and even months from the eastern ports of the Mediterranean, an impregnable port of call at the junction of the Mediterranean and Atlantic seas became a positive necessity alike for men-of-war and transports to victual and water, or as a rendezvous for a storm-beaten or damaged convoy. Owing to the advances which science has made, the most ordinary foreign-going steamer can now carry without inconvenience all that is desirable for the longest voyage, thus in a certain sense rendering ports of call of less value than they formerly were. By these remarks it is not pretended that England should give up an outpost which for nearly two centuries has been the scene of so much usefulness and so much glory, but we wish to show Englishmen that its abandonment would not be fatal to the integrity of the Empire, useful as its retention is for commercial purposes.

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If steam has lessened the value of Gibraltar as a port of call it has in a greater degree rendered it less secure from attack by sea, just as the precision with which rifled cannon can now be used has lessened the value of those world-renowned galleries. From neutral ground a well directed gun might pitch its shell into the entrance, notwithstanding the plunging fire to which the enemy's gunners might be exposed in return. The precision of modern gunnery is simply marvellous. In the great siege the ordinary smooth bore guns fired red hot shot into the floating batteries with destructive effect, a mode of warfare that the enemy had no object in following. Modern shell has swept away this advantage on the part of the besieged and exposed them to the effects of missiles whose destructive effects cannot be overrated in exposed bastions and open towns. Gibraltar falls under both these disadvantages, and as the bay is perfectly free from dangers, attacking ships can take up with impunity any desired position by night or by day, and under such cover, land storming parties at more than one point when darkness had set in. Fortunately the people who are most deeply interested in recapturing the famous rock are not likely to develope into formidable enemies, but it is not impossible that under certain conditions they would cast in their lot with France, and in case of a series of naval reverses to England might prove troublesome, if not dangerous neighbours in supporting a blockade. The inhabitants and the garrison alike draw their supplies from Spain and the coast of Barbary, the rock having no facilities for cultivating the most ordinary vegetables. It is singular how quickly the pinch of hunger is felt in a beleaguered town, especially as the inhabitants cannot for some time realise their position, so that much is often wasted before the screw is put on. The civil population of Gibraltar consists largely of different cross-breeds, all of whom are more Spanish or Moorish than English in heart as well as race, men who would not be of service under any conditions, and whose fidelity to their present masters is more than doubtful. The grave Moor still dreams that his countrymen will yet recross the straits and recapture the first seat of their power in Spain. Till that time arrives he is indifferent to the nationality of his governors.

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Again, at the present time a convoy of merchant ships anchored in Gibraltar Bay would be terribly exposed to the attacks of active cruizers. Owing to the great depth of water, but few can anchor near the defences, hence they would have to range round the Spanish waters of the bay and remain exposed to the effects of long-ranged field guns from the Spanish shore. It is therefore evident that, as a place of rendezvous, its value, in case Spain were a belligerent, has materially lessened since the great siege.

Malta is the next resting-place going east, and must, so long as England is interested in that much vexed Eastern question, remain of paramount importance as a first-rate fortress, port, military hospital, and arsenal. Its value during the Crimean war can scarcely be overrated for these purposes, but when it is remembered that even Turkey may not always be our ally, and that Italy may appear on the field in future wars, the *entourage* and resources of this singular spot are deserving of the attention of English statesmen in a pre-eminent degree. The island labours under two disadvantages—an enormous population and no home resources to supply the most simple necessaries of life. In our own time there has been a practical hint of the manner in which this tells, although it has probably been forgotten by many who were in Valetta when the incident occurred. In 1848 private enterprise had constructed war steamers, whose speed was superior to those of the English Navy. Naples had one in commission at this time named the *Guiscardo*. When Sicily was in insurrection this frigate stationed herself in the waterway between Cape Passaro and Malta, and cut off every speroni that attempted to carry supplies to the island. Food rose to famine prices, and our men-of-war vainly endeavoured to overhaul this vessel, in order that an understanding might be arrived at. Her commander, however, would hold no intercourse, invariably steaming out of sight when our ships essayed to cut him off. After this state of things had lasted some days, a steam sloop, on board of which the writer then served, arrived from England. As she had been fitted to run the mails between Malta and Marseilles, two of her medium 32-pounders were landed, leaving the same number on board more with the object of exercising the crew than fighting purposes. Her steaming powers

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vere remarkable for that day, and two engineers of the old school kept the machinery in the most perfect order, always speaking of t in the feminine gender with great affection. About noon the *Guiscardo* was seen from St. Elmo signal station standing in for Gozo, evidently with the intention of cutting off a mosquito fleet of small craft from Sicily. The Admiral made the signal for us to get steam up for full speed, and for the lieutenant commanding to repair to his office at the dockyard. He returned after a brief visit and announced that Captain H—— would arrive on board in a few minutes to take temporary command, as the Neapolitan was to be overhauled if possible, and brought to at any price. We beat to quarters, but the two small broadside guns did not look as if much could be accomplished with them against such odds, if the Neapolitan frigate resented inteference with the legitimate object of his cruise. However, everyone was in high spirits, and the grim old carpenter's mate, after seeing to the shot plugs, sat down by the grindstone to set an edge on his cutlass, remarking that he was good for any six of them maccaroni eaters. The new captain's galley dashed alongside, the squad of marines, three and a corporal, presented arms, and shortly afterwards the steamer left in chase. On clearing the harbour the Neapolitan appeared at once to have suspected that he had a chance of being outsailed, for in lieu of leisurely waiting, as was his custom, until almost within gun-shot, he at once dashed off to the northward at full speed. It was now a fair end on end chase. For a long time no perceptible change in the relative positions of the two ships could be detected, and we began to think that darkness would intervene before anything could be done.

"That vessel steams well," said the old engineer, "we are doing more than our best, and yet I do not see that we are rising her at all." It is probable that from the first we had steadily gained on the chase, but it was long before a sextant angle indicated that the distance was really lessening. When it did so it came with a jump, and the crew fell in quietly to the two guns, which had been run over to the starboard-side. Through our glasses we could see that the *Guiscardo* was following our example, by clearing away hammock-nettings and letting fall the hinged bul-

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warks. Her armament was two pivot 68-pounders, and four medium guns of the same calibre, with a crew of two hundred souls, yet no one appeared to have the slightest doubt of our ability to capture her somehow if it came to a stand-up fight. That old feeling of invincibility still lingered in the breasts of British seamen. Time has changed all that now, as England will at some future day most certainly find out. "Run as close as you please," said the new captain, very quietly; "but do not hit her," and thus with the paddle floats apparently lifting the vessel over the sea we ran at full speed to within a couple of feet of the Neapolitan's paddle-box. There was a pause for a moment, and then Captain H——, after saluting her commander and his staff, hailed as follows :—"You have been starving Malta, and his Excellency the Governor desires me to say that you must refrain from doing so any longer, or other steps will be taken." At the first sound of his voice the *Guiscardo* suddenly stopped engines, her commander at the same time calling out, "I will send a boat on board and explain." We sheered off, followed her example, and shortly afterwards an officer came on board. He briefly stated that the cruise was over and their orders were to return to Reggio without delay. Macfarlane in his "History of Italy" alludes to this incident in very strong terms, styling it one of the greatest acts of bullying ever perpetrated. It is difficult to see where the bullying lay. An English island was being severely straitened by the action of a vessel belonging to a friendly power, and although Sicily was in open insurrection, the inoffensive boatmen had neither part or parcel in it. But admitting that they had, the law of self-preservation warranted the action taken by the governor. It is idle to suppose that men with arms in their hands will submit to unheard of privations when plenty is within hail. Further, if the Neapolitan captain deemed himself insulted, he had a formidable ship at his command to maintain the dignity and honour of his flag, or he might have refused to give any explanation to a foreigner for interfering with Neapolitan subjects when Sicily was in revolt. Straws indicate which way the wind blows, and it is impossible to contemplate with equanimity the condition to which the inhabitants of Malta might be reduced by even a

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partial blockade. Have the Horse Guards and the Admiralty seriously weighed and solved this very important and very complex problem, or is the country to wait for its development until hostile cruisers are threatening the communications ?

As a fortress, La Valetta is impregnable. The town might be shelled from the sea, but the ships employed could not do it without subjecting themselves to the fire of the formidable guns of Ricasoli, St. Elmo, and Dragut, so that beyond injury to the town, no material danger need be anticipated. The soft sandstone of which the town and forts are built, resist admirably the effects of shot or shell, where granite would splinter and disintegrate. Malta must, however, always become the appanage of the leading naval power. To none other would it be worth maintaining, for like everything else connected with war, it is an expensive necessity.

Steering eastward we strike Cyprus, about which so much has been written and spoken. The annexed opinion of its merits and demerits was written at the time the island was handed over to British rule, circumstances have in nowise changed the views then enunciated, and the general who is ordered to mobilize his army there, will find, when too late, that disease had thinned his ranks before he had an opportunity of launching them against the enemy. As torpedoes and light ships increase in effectiveness, the value of Cyprus will, if possible, become less than it is at present.

" Officers who were well acquainted with the climate of Cyprus looked grave when informed that a large army corps was to be encamped on the island in the height of summer, and the results thus far have certainly borne out their misgivings. The unacclimatised Englishman cannot with impunity work under the rays of a sun practically tropical, without incurring great risk of contracting the fever of the country, and it is not a little singular that the characteristics of one of the most subtle of diseases should have been treated so lightly, when it is certain that the germs often remain for many years in the most robust systems, and in others are never annihilated. Change of air and scene are absolutely necessary to restore the invalid, and there cannot be a

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doubt that if the 101st Regiment had, as was at one time contemplated, been sent to Singapore, the mortality would have startled those responsible for the act. We gather from our illustrated contemporaries that our ever-ready Blue-jackets toil cheerfully from morning to night in building jetties or disembarking heavy stores. But this exposure, if disease be in the air, will bear more bitter fruit at no remote period than it has already done. At St. Juan de Nicaragua the ballasting of merchant transports from the beach was the great predisposing cause to the attacks of the well-known and much dreaded 'Chagres' fever, the effects of which cannot be eradicated on the spot. Another peculiarity was remarked, that the worst cases did not show until a ship had been many days at sea, when they would run into a bilious-remittent type, closely allied to the worst species of yellow-Jack. From analogy, it is quite probable that the fever of Cyprus may have similar characteristics, and every precaution should be adopted to meet it.

"Cyprus labours under, for naval purposes, the serious disadvantage of being without harbours, neither does it possess any of those magnificent estuaries which engineering skill can readily convert into secure roadsteads, Lanarka and Famagousta being open to all winds with easting. It would not be possible to estimate for either port the cost of the construction of a good breakwater, with landing-jetties and moles. But if this were executed, the nature of the coast offers every facility for shelling by an active enemy, either by day or by night, the clean, shelving shore interposing no dangers until close to. From a careful consideration of the above facts, it is evident that this generation cannot hope to hear the new acquisition hailed as the Malta of the East.

"A short sail west, however, is an island which possesses one of the most magnificent harbours in the Mediterranean, perfectly capable of containing a fleet of the largest class of ships. Deep water is found close to the shore, and the heights and islets around may, by means of the spade, be easily turned into impregnable fortresses. The shells of hostile cruisers could not molest the shipping in Suda without their being subjected to a heavy cross fire from the batteries at the entrance. Across a narrow strip of

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country is the ancient port and arsenal of Canea. The old Venetians were well cognisant of its value, and erected a mole and covered sheds for the shelter of their war-galleys. At that period there was no reason to fortify the grand bay, and its present possessors have not deemed it necessary to alter the existing arrangements, although their ironclads and heavy frigates may often be seen riding at anchor close to the head during the winter months.

Of one point there cannot be a doubt, which is, that remoteness from the scene of possible warlike operation may, in these days of rapid ocean steaming, be safely disregarded, for the skill of modern engineers has practically bridged the short belt of water which divides Crete from Cyprus. The superiority of the climate of the former cannot be questioned, and as England does not require an accession of territory in the East, but an impregnable base of operations, Nature points to Crete as the favoured spot, and leaves diplomacy to manage the rest.

"In the *Nautical Magazine* for October is a very able article on yellow fever, and strong comments on the impropriety of allowing our seamen and soldiers to work under the influence of a Syrian sun. The writer gives the scientific reason why fever is contracted by those employed in ballasting ships from the beach. In all wars sickness destroys threefold, or more than the enemy's missiles, notwithstanding the deadly nature of the weapons which modern science has forged. There were, doubtless, cogent reasons for rushing an ill-housed body of troops on Cyprus, but it does appear singular that the real nature of the climate should have been so little understood by the authorities. In this instance there has been time to redeem the error so far as human life is concerned, but experience will prove that neither time or money can fulfil the views entertained by the founders of the enterprise. English energy and English capital may develop the island into an earthly paradise, but not all the genius of the Admiralty and Horse Guards combined can, in this generation, turn it into a formidable naval port and arsenal. It would never do in these days of destructive shell firing to allow convoys of transports to lie within easy range of the guns of an active enemy, and a glance at the

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chart will indicate that anything lying under the shelter of a mere breakwater, even if formidably armed, would always be subjected to this danger."

Corfu was, during its occupancy by the English, a fortress and port of the first class, and, by its happy geographical position and fertile soil, free from many of the serious disadvantages which during an active naval war would press heavily on Malta. It is too late to recall what has been done, but had the island still been under the English flag, Parliament would have hesitated to give up such a jewel. Since that day one of the most thriving and the most charming of islands has become the seat of squalid poverty. The resident English have departed, and grass is growing in the streets. A friend of the writer recently visited the capital in a man-of-war, and a report got wind that its former masters had returned to take possession. There were great rejoicings, followed by a corresponding depression when the truth became known. Like many others, the Corfuites failed to appreciate the happiness of their circumstances until bad times and the conscription had forced on them the disagreeable truth that their former prosperity had departed, not to return in this generation.

It would be impossible to sketch out a plan for the defence of the Suez Canal. In a very great measure it will depend on the internal condition of Egypt and the possessors of Constantinople. The latter is the key, and in strong hands might easily be effectually turned in the face of Europe. The roads through Syria to Gaza are good. A small military force, resting on the support of a greater at head-quarters, would quickly become masters of the situation. So far as the security of India is concerned, the Canal is a weak link in her armour. On the Atlantic, England scarcely had a rival until this waterway diverted the Eastern trade from the Cape route. The change has added much to the national wealth at the risk of rendering it less secure. It is useless to harp on a question which is an accomplished fact. The genius of M. Lesseps has done more to imperil the safety of English commerce with the East, than the rivalries of peace or privateering in war possibly could do.

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The policy of abolishing the East Indian Navy was one of those gigantic political errors which, under the existing state of Europe, can hardly be realised; and the manner in which it was carried out illustrates in a striking light the narrow-mindedness of the authorities of the period. A body of accomplished officers, without the slightest fault on their part, suddenly found themselves deprived of their profession, and in a certain sense of their means of livelihood; for men who during a long series of years have lived in a certain style on a fixed income find but little margin for retrenchment. A few of these able men found their way into other branches of the public service, where they made themselves conspicuous by their professional knowledge, their discipline, and their strict attention to duty; but the majority, like Cromwell's Ironsides, became absorbed amongst the population, and have passed out of sight if not from memory. To this force India was an adopted country. They were intimately acquainted with its people, its customs and its hydrography, thoroughly identifying themselves with each. The most deadly service in the Persian Gulf, or the swamps of the Tigris and Irrawaddy were cheerfully encountered. It was a part of the duty they had contracted to perform and was carried out without a murmur. Cholera and dysentery thinned their ranks, but others equally devoted stepped without hesitation into their posts, and too often into their graves. Those who have not served on this station in former years cannot realize the discomforts of the old-fashioned vessels of the last generation. Crowded, cribbed, and confined, they were as well as overrun with rats and gigantic cockroaches; fleas and bugs could not fortunately live. In a temperature of 100° in the shade, with occasionally short allowance of water, and the coarsest of provisions, it is not astonishing that so many died in the prime of youthful manhood or contracted diseases which were irremediable, if not ultimately fatal. In all parts of the great Empire of Clive and Hastings down to the date of the mutiny, their utility as distinguished public servants was universally acknowledged, and now, after the lapse of a quarter of a century, statesmen admit that the great error committed by their predecessors must be redeemed at any cost.

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The army met with more generous treatment, were incorporated with the royal service, and their exploits before and since well justified the wisdom of the Imperial government in following the course they did. From newspaper reports the so-called marine of India is now of no practical value even for the defence of the great maritime ports. The discipline appears to be subjected to no regular code, and it is unnecessary to add that, under such circumstances, even numbers cannot make up for its absence in this age of scientific warfare. Had the old Indian Marine been in existence, its officers would be abreast of the times; as things now are the service has to be created. Years may elapse before it can take a position of importance in the list of colonial defences. It is painful to think of the manner in which a single fast cruizer with an able commander might sweep the eastern seas. At this moment it might be carried out with impunity. England's slow sailing corvettes might follow in his track and become a species of floating depôt for the crews of the ships plundered, burned, or scuttled. A small fleet of swift cruizers armed with a couple of guns each and a certain number of torpedo boats are indispensable adjuncts to the defences of Bombay and the Bay of Bengal. At present a single antiquated ironclad represents the principal maritime defence of the former port. It was a subject of congratulation to naval men that this vessel crossed the Bay of Biscay without mishap. Doubtless, a shoal of beef-bones has long since formed around her, unless circumstances have compelled the authorities to shift her moorings from time to time as they accumulated.

The formation of a corps of volunteers at Bombay indicates that the European population are thoroughly cognizant of the danger they run from the state of unpreparedness of their city. It is gratifying to learn that the regular army are at last awaking to the fact that these corps are not only fit to act in line with their best troops, but for particular service are superior to some of the crack regiments. In physique and powers of endurance they are unquestionably so, owing this to being better cared for in youth as well as the moral force of prestige of birth.

To whatever side we turn in the eastern seas the same elements

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of weakness are visible, not even the approaches to Calcutta, Rangoon, or Hongkong are safe from a daring enemy. Colombo and Madras are open roadsteads, so that their defences must depend greatly on the fleet. The former capitulated without firing a shot. Trincomalee followed, and the island has since remained under the rule of England as a crown colony.

(*To be continued.*)

CARGO STEAMERS: THEIR SHAPE AND THEIR CREWS.

From a Seaman's Point of View.

MUCH has been written, and more has been said, about the dreadful losses of cargo steamers since the winter of 1878. If you will grant me the space in your journal I will offer some remarks on the vessels known to seamen as "grain waggons," "coal boxes," and "sea-going warehouses." Very great importance has been and still is attached to the load-line, and deservedly so; but no notice, so far as my reading goes, has been given to the shape of cargo steamers, or to the horse-power with which they are provided. Take ninety-nine steamers out of every hundred built as exclusively cargo vessels, and you will find them with the same breadth of beam from the fore part of the fore-rigging to a point close up to the quarters. They are flat-floored nearly from end to end; wall-sided, drawing as much water in the bilge as amidships, and with no tumble home. Hence, their stability in heavy weather is dangerously small. Crank when loaded, even more so than in ballast. Good steering cannot be expected of steamers of such shape; therefore their behaviour, whether in an Atlantic gale or when steaming through the Suez Canal, is equally one of blundering and staggering. In the former case (a gale) falling off into the trough of the sea, and in the latter running aground and blocking the sea-going traffic of Europe for days. On the quality of the iron used in the construction of cargo steamers I will make a few remarks. No attention, as far as I know, has been given to this

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important subject. How far are ship-plates and angle-iron removed by manipulation from the iron-stone? and what amount of rigidity has this material? I can state from actual experience that it takes very little to break them, and then they (plates and angles) go like cast-iron, which (to me) they strongly resemble. Of the behaviour of these vessels in heavy weather it would be useless to write; the numerous accidents, abandonments, losses, and vessels missing give a sufficient answer. They "turn turtle," or they founder, often owing to their immense hatches (chasms, four in number) being stove in by the heavy water these vessels ship. I will now describe how these cargo steamers are manned. A steamer carrying 2,800 tons of coal would have six A.B.'s, a boatswain, and a carpenter. With one man at the wheel, one on the look-out, we have one man and the boatswain *or* carpenter to take in and make sail, or to get a cast of the lead. This number of men is an absolute fact, and can be easily proved by examining the "Articles of Agreement" at our numerous shipping offices. Considerable responsibility is incurred by an officer who leaves the bridge during his watch; but how is he to manage without so doing in the vessels I am describing? You cannot heave the log with two men; neither can you get a cast of the lead. Your non-nautical readers may say, "Call the master;" but the master may have been on deck for the last twelve hours. Others may say, "Use the patent log." Quite right, if you have one that you can depend on; if not, a check by common log is necessary.

Horse-power in cargo steamers is much too small. A vessel carrying 2,800 tons would not have more than 180 horse-power nominal (whatever nominal horse-power means), and then she would be registered as 200 nominal horse-power. Why should masters of cargo steamers be handicapped to the tune of 20 or 30 horse-power? and why do managing owners register their steamers with more power than they really have, and why are they permitted to do so? Take Lloyd's Register of Shipping, observe the various powers given to engines of same dimensions, and same pressure on boiler. Nominal horse-power is in the opinion of intelligent seamen a myth, anything, nothing. Indicated horse-power, or a guaranteed speed *when loaded* we think, should

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be insisted on. The trial trip, to a certain rate of speed of a cargo steamer *in ballast*, is certainly very strange to us seamen; I suppose *naval architects* could explain.

Captain Shackford in your March number, speaking of steamers heaving to, says, "the sea was simply terrific, and the squalls so heavy we could only steam from one to three knots an hour;" he continues, "every experienced officer knows that it is impossible to steer a ship in such a sea at that speed." If such was Captain Shackford's experience in a fine, full-powered ship like the s.s. *Illinois*, what plight would the vessels be in that are known as *exclusively cargo steamers?* If I may offer an opinion, *exclusively cargo steamers* require more *shape* and less capacity. *Shape*, seamen believe, gives strength, speed, and seaworthiness; without shape it is useless to fuss about a load-line. Owners, or builders should not be allowed to carry the extreme beam so near the extremities of the vessel. They should give the cargo steamer more power, less depth of hold, and more seamen. How are these changes to be effected? What hope have seamen to look for these reforms in the food-supplying steamers of England? At present the master of a cargo steamer is simply a *buffer* 'twixt the owners and builders, and the law. If he attempt to sail his vessel with some regard for Board of Trade Instructions and Rules, he is liable to dismissal. If he sails his vessel to please the managing owner he risks the loss of his certificate. His licence to command comes from the Board of Trade; his obtaining and keeping employment depends upon the caprice of the managing owner, whose experience, in too many instances, is limited to his distinguishing one end of the ship from the other, and who carries out a dangerous economy because he is protected by insurance. Blow high or low, turn turtle, float or founder, the owner is protected. If his vessel lose a sail, or a companion hatch, skylight, or bucket, the small damage club comes to his rescue and stumps up the value thereof. Not so the master; he may be driven by a sea through wheel-house or chart-house, or washed off the bridge on to main deck, breaking his limbs and half-a-dozen ribs. Even *then* he is expected to continue his passage with a damaged ship, perhaps with all boats washed away and suffering agonies him-

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self. If he return or put into port to repair damages and to obtain medical assistance, he is considered *unequal to emergencies*, and on arrival a *change is considered advisable*. Should he continue the passage with his disabled ship, and life, or ship be lost, then if he be alive the Board of Trade is down on him and his certificate. Should he lose his ship and his life, leaving a few (picked up) to tell the tale, we have the usual decision of the Court of Enquiry, "Ship was not too deep, cargo was well stowed, ship was well found, sufficiently manned, and in good condition." A few words of praise for the late master in sacrificing his life and the lives of others in endeavouring to accomplish impossibilities in an unmanageable tub. So it ends. The master's widow may go to the workhouse, and so may all the other widows. The owner recovers his freight and the value of his lost ship; then he builds another, just the same shape and build, only larger, and the chances are ten to one she meets the same fate. It would be a melancholy, but instructive return, if we could ascertain how many widows of masters, mates, and seamen, and engineers are now destitute owing to the loss of their husbands by foundered or missing vessels, known as cargo steamers. It has for some years been a puzzle to masters why the "model" or *facsimile* of steamers lost by foundering or capsizing is not produced at Courts of Enquiry. Its production would give Assessors a *silent*, but eloquent and truthful witness, and would do more to explain the cause of losses than all the evidence of living testimony. From the latest published Return I find there are 192,972 seamen employed in our Merchant Service, *exclusive of masters*. Assuming that it takes thirty-five men to require one master, one mate, and one second mate (and not counting engineers), we have 17,397 intelligent men totally unrepresented in Parliament. It may be said they are represented by shipowners. Seamen are no more represented by shipowners than the tenant farmers and agricultural labourers were represented by the landlords—the landlords represented themselves—shipowners do the same. Your Liverpool correspondent in your March number writing of the proposed Shipping Council, says, "Interference with private property is so repugnant to the feelings of Englishmen that the sympathy of most men

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is at the outset on the side of the shipowner interfered with and against the meddlesome official. The interference is on behalf of the seaman, and for his benefit and protection. Why does not the seaman do something towards looking after himself?" If the English shipowner built seaworthy cargo steamers he would not be interfered with. Let him attempt to build similar steamers for the passenger trade, he would soon find much more interference. What can the seaman do for himself? Strike? That is next to impossible, seeing that there are at all times more men at sea than there are in port; and foreigners, who should not be in our service, will always "jump in" when Englishmen hold out. If it were possible for all seamen in port to strike for seaworthy vessels, or for vessels carrying *less* than double their registered tonnage, England would learn the value of her merchant seamen or starve. There is one possible loop-hole of escape towards which our seamen look anxiously, that is the revival of American shipping. One Bill through Congress will do it—then the transition of the British seaman to an American ditto will be quickly and easily effected.

My remarks in this paper apply to the mushroom managing owner and *his* cargo steamers. Our large companies, or firms, and their steamships are the finest in the world. I firmly believe British seamen would rather sail in their steamers loaded down to the scuppers than in an exclusively cargo steamer in ballast trim. Seamen want the right to exist or to die in a seaworthy vessel, after a fair fight with the elements, and they seek assistance wherever it is to be had.

TWENTY YEARS IN STEAMSHIPS.

CORRESPONDENCE.

SIGNALLING BY NIGHT AND WITH THE SEMAPHORE.

To the Editor of the "Nautical Magazine."

Sir,—I was glad to notice in your last number that the question of signalling in the Merchant Service has been broached, and especially that of night signalling.

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It appears incomprehensible in these enlightened days that the only night signals we have are "Distress" and "for a Pilot," and there are no means at present, at night, even to warn a ship she is standing into danger, or to communicate any important information.

With regard to the semaphore for day use, as published in the "Sailors' Pocket Book," "Nares' Seamanship," &c., its advantages cannot be over-estimated, and for its simplicity and rapidity, it bids fair to become the signalling of the future.

Its economy is another great recommendation, as there is no wear and tear of bunting, and as it can be made on board; the cost of the material is the only expense. In some of the ships in which I have served, it has been used with great advantage, both in communicating with men-of-war and our own vessels.

I am, Sir, your obedient servant,

London, February 26th, 1882. W. D. G. W.

COLLISIONS WITH LIGHTSHIPS.

To the Editor of the "Nautical Magazine."

Sir,—In this month's number of the *Nautical* is an article, "Collisions with Lightships," in which you express an opinion that the discredit is entirely due to vessels under way.

If you will forgive me the liberty I am taking, I will give you my opinion, from a steamboat point of view, and I hope I may convince you that I, for one, am as anxious to still avoid colliding with a lightship as you, Sir, yourself may be. I think there is no possible excuse for a steamer colliding with a lightship in clear weather, unless under very exceptional circumstances, which I need not waste your valuable space in enumerating. But in fogs there may be something to be said on both sides. I notice, in the list of collisions given, there is nothing said about the kind of weather they occurred in, whether fog or clear.

I have been an officer twenty years, eleven in command, navigating the Bristol Channel in the cattle trade from Ireland, during which time we have had many improvements, and I, for one, am grateful. At the "Helwick" and "Scarweather" lightships there

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are good fog-signals, but at the "Breaksea" and "English and Welsh Grounds" lightships, where the *tides are stronger* and the *channels narrow*, they have only gongs, which on board a cattle-boat, with the various harmonies in full tune, cannot be heard twice your length. In the first-mentioned ships a master may, as you suggest, give them a wide berth, having plenty of room to do so, but in the last-mentioned you have cross tides and narrow channels.

A steamship, by the Rule of the Road, very properly must go slow, and keep her whistle going. The louder I can whistle, the safer I think the lives and property are under my charge. But here are two lightships, *at least* I can say one, past which the stream will at times carry an object through the water at the rate of from five to six knots per hour, without anything to indicate their whereabouts, but what is very much like beating a frying-pan with a wooden mallet; it may be effective in some cases, but cannot be heard above the din in one of those steam-boats. The lightship then, instead of being a guide, becomes another source of anxiety among the many which assail one in a fog. My experience also as to the riding light, showing the set of the stream, is contrary to yours; they are as often wind-rode as not.

I dare say the authorities are doing all they can to help us, and they have done a great deal; but I want you to think with me there are times when even the most careful may drift foul of a lightship in a strong tide and a narrow channel, through the fog-signals on board of her not being loud enough to be heard in time to clear her.

Yours truly,

WM. A SEAVELL,

Wexford, March 12, 1882. Master *Briton*, s.s.

CERTIFICATED OFFICERS AND EXAMINATIONS.

To the Editor of the "Nautical Magazine."

Sir,—In my last letter I mentioned the custom of carrying a boatswain instead of a second mate in many steamers. This is

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corroborated in the facts elicited at a court of enquiry concluded here yesterday. I refer to the s.s. *Rosebud*, whose boatswain admitted in evidence that he did not understand the Rule of the Road at Sea. Some severe remarks were made by the Court on the subject, censuring the master for entrusting such a man with command of a vessel on a crowded coast. If masters would only think for a few minutes before shipping such incompetent men they would see it was really their own and their owner's interest to engage *competent* (as distinguished from certified) men, even at a few shillings more wages.

It is *quite possible* that the fact of an incompetent man being in charge of the ship at the time of an accident might void the policy of insurance, and even cast the owner of such a wrong-doing vessel in damages to a very heavy amount; and, as has been shown, endanger the master's certificate. This ought to make men very careful in shipping officers, and should lead them to take certified men when possible, that is, with his knowledge of the men, &c., other points being equal. So many men have now Board of Trade certificates that there are usually several, often many, to choose from in all the principal ports in the kingdom. The increase in the number of steamships, and practice in the handling of them, leads too many men to attempt short cuts, and close shaving, as our damaged lightships show; therefore an officer now, more than ever requires to be *quick* and *sure* in forming his decision, and in carrying it out when rounding many of our headlands, and lightships especially. I know men who never do ship mates without subjecting them to a cross-examination on the Rule of the Road. During that examination they can find out their vacillating and indecisive character if any such there is. I need not say they are rejected at once. This leads me to speak of the character of our examinations in regard to the Rule of the Road. It is notorious that numbers go and pass, and then act for years as mates without ever really mastering the rule, as numberless collisions show. That there is a screw loose somewhere about these examinations *most* men agree. "*Help yourself and your friends will like you the better*," ALL men agree. *We* have helped ourselves towards getting more justice in courts of inquiry why

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not help ourselves in this also? Only let us agree. We have several Protection Societies throughout the kingdom, let us take it up in them, discuss it, and find out the weak points, it will then be easily remedied.

I remain, Sir, yours most obediently,

March 9, 1882. ALEX. JACK.

MARINE CHARITIES.

To the Editor of the "Nautical Magazine."

Dear Sir,—As a British shipmaster and subscriber to your journal for the last few years, I venture to ask you to allow me through your pages to make an appeal to all my brother shipmasters. I wish to draw their attention to a duty, I ought rather to say a privilege which attaches to them the moment they accept the responsibility of a shipmaster, and presses equally upon all, whether they command the largest steamboat or the smallest sailing vessel.

Different ports may have their own local charities for the benefit of seamen, but I am writing as a London shipmaster, and I recognise three great charities established there for the special benefit of merchant seamen. First we have the *Royal Alfred Aged Merchant Seamen's Institution.* Again we have the *Merchant Seamen's Orphan Asylum;* and last, but certainly not least, the Seamen's Hospital, Greenwich (the *Dreadnought*). No British shipmaster can well deny that each and all of the charities are much wanted, and if they have paid but little attention to the subject they will admit that all are excellently well managed; and having got thus far, I cannot imagine how any shipmaster can rest satisfied without in some way helping to make them more useful.

Now the object of my letter to you, Sir, is to point out how this can be done with scarcely any *trouble* and very little *cost* to the shipmaster himself. Let me first take the case of a sailing vessel voyaging anywhere south of the equator, where the voyage extends from eight to twelve months.

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I suggest that after the vessel has been a few days clear of her port the captain should consult with his officers how and under what circumstances a day could be selected which should be made a holiday for all on board; then let the crew know, and the knowledge should be given by the captain himself in such a way as to show the men the personal interest he takes in the matter. Let them know that on the day appointed some kind of amusement (it matters very little what form the amusement takes, only let the day be a holiday, and spent different to other days) will be arranged for, and that the object in the captain's mind is to aid one or the other of the public charities established for the benefit of seamen.

When the day arrives, arrange that all work is put on one side, and the deck cleared up before dinner. Give the men the benefit of the best dinner the circumstances will admit of; then during the afternoon and evening carry out your programme of amusements; or should it happen that no special form of amusement has been organised, let the men spend the time as they like best. My experience of seamen goes for nothing if after a day thus spent an appeal to their generosity to aid in a work of charity is not answered by such a general subscription as would be a great surprise to most men; and let this be repeated each passage, and how soon should we see a different feeling spring up between officers and crew.

With regard to most steamboat and sailing vessels making shorter voyages I can see no difficulty in establishing a practice of selecting two days in each year, one day about Christmas-time and the other near Midsummer or Whitsuntide, let these days be made as far as possible holidays aboard of all such ships. Let the same attention be paid to the men's creature comforts with an afternoon's amusement organised amongst themselves, and afterwards make an appeal to their good nature in aiding, by adding to the funds of some one or other of the charities established for their own special benefit. If my brother shipmasters would only give this ever so little thought, they would find the practice come wonderfully easy and the result far beyond what they can readily realise without a trial.

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In the above remarks I have only written of ships having simply their crews to work upon, but there is a large number of steamboats, and a few sailing ships carrying first-class and other passengers. Where such is the case the master's duty and the privilege of his position becomes far more important with regard to this matter, and it has always been a cause of wonder and regret to me that greater advantage is not taken of this means of helping our charities.

My experience of passengers is this, that with very few exceptions, if you only show the most ordinary interest in their little wants and troubles at sea, and make the slightest attempt to lessen, by amusements, the monotony of the voyage, you at once secure their good will, and any appeal made to their sympathies on behalf of our seamen is at once replied to with a generosity rarely met with under any other circumstances. It only requires a little tact to appeal at the proper time and in the most convenient manner.

If all shipmasters would only look at this duty conscientiously and make an honest resolve to do their best, I have no hesitation in saying that in the course of the next three or four years we should, in the first place, see with regard to our London charities an income from the ships alone equal to what they now get from all sources put together, and we should also see that feeling of confidence and good will as between captain, officers, and their men which we are so anxious to bring about.

There *may* be owners of ships who would begrudge the expenditure of a few extra stores for such a purpose, but I decline to believe it until I get positive proof, and few shipmasters, I am sure, would ever regret their own contributions either in the form of *money*, *time* or *trouble* when they saw the good they were doing. My dear Sir, I would give a good deal if I could put this appeal into such words and in such a form as would *insure* attention on the part of those to whom it is addressed.

I have always taken a very deep interest in this matter ever since I have held any position of trust, and as a proof of what can be done by anyone in my position (and there are many other masters quite as well placed as I have been to work in this way).

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I may mention that during the sixteen years I have had command I have been enabled to pay to different charities £1,717.

Since writing the above, and being on my outward passage to the colonies, I held another of our so-called "Fancy Fairs" with the very satisfactory result of having a further sum of £55 to be added to the above amount.

Having always had passengers on board I early adopted this idea of a "Fancy Fair" and have found it answer the purpose so well we have been content to keep it up. Perhaps it may be of some little interest if I state in as few words as I can how the day is spent, and the different scources from which I get the money together.

In the present case it was Wednesday, November 2nd, a lovely day, nothing to interfere with what we were about; by eleven o'clock the decks were cleared of all work, and the watch employed getting the poop ready for the afternoon; by noon all was ready and the men sat down to a good dinner of *fresh* mutton, &c. with a pint bottle of beer to each man. They were then asked what money they required, I may say here that I never advance more than 5s. each to the A.B. or 2s. 6d. to the boys and I find it is very seldom indeed any of them ask for less, unless they have money of their own. By two o'clock, all the mid-day meals being finished, the fun commences and continues to about six or seven o'clock; what the fun is will be best shown by giving you a list of the different channels through which the money reached my hands:—

	£	s.	d.
First then articles sold at the stall	22	0	0
Refreshment	6	19	0
Wheel of Fortune	6	5	0
Lotteries and Auction	7	3	0
Shooting Gallery	9	5	6
Theatre Royal	0	18	0
Fine Art Gallery	0	17	0
Aunt Sally	0	12	0
Post Office.....	1	0	6
	£55	0	0

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No *wines*, *spirits*, or *beer* are sold on these occasions, and on this voyage the total number of souls on board did not exceed 120.

In the evening, the saloon being prepared for the occasion, we had an excellent drawing-room play called "Freezing a Mother-in-law," at which everyone on board could be present and at about ten o'clock we in the saloon sat down to as good a supper as our circumstances admitted of, and I fancy it would astonish many people to see what can be done at sea in that way; the *other passengers* are not forgotten, and I am quite sure every one on board will look back upon that day as the most pleasant one spent on board; at least they all try their best to make one believe it is so.

Now let us see what this all amounts to: so far as the owners are concerned they have been put to an extra cost of about £3 and the ship loses say four hours' work. To myself it has been a cost of about £2 10s. in cash spent in London for materials for the ladies to work up on the passage, the principal articles sold were given me in London by three or four kind friends, no one on board has been in the slightest degree *urged* either to *work* or *give*, everything has been spontaneous on the part of both passengers and crew. I had merely to say at the commencement of the voyage that I should feel extremely obliged if the *ladies* would help me to carry out the usual programme; they at once said they would do their best *and they did*.

SHIPMASTER.

OUR COAL PORTS.

To the Editor of the "Nautical Magazine."

Dear Sir,—I observe in your February number the statistics of coal exports from the "coal ports" during 1881. In that list Newcastle holds the lead for amount shipped both foreign and coastwise. She has long held that proud position. In January 1882 she has, however, been eclipsed. For some time Cardiff has been at the top of the list for foreign exports merely;

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now she takes the *pas* for both combined. The figures stand thus :—

Cardiff—Foreign	479,090 tons	
Coast	78,771 ,,	
Total	557,861 ,,	
Newcastle—Foreign	268,415 tons	
Coast	276,267 ,,	
Total	544,682 ,,	

I am, &c.,

Cardiff, February 13, 1882. W. T.

BOOKS RECEIVED.

The Scientific Roll and Magazine of Systematized Notes; Nos. 1 to 6; Conducted by Alexander Ramsay. London: Bradbury, Agnew & Co.

The numbers of the "Scientific Roll" now before us appear to be devoted to climate, and the various notes, gathered from many sources, are no doubt good and well selected; but we must confess to be somewhat puzzled by the "General Bibliography;" it is certainly not as complete a list of works as could be got on the subject, and we could indicate many more than are given; we also miss many that might have been aptly selected from André Poey's "Bibliographie Cyclonique."

Traité Théorique et Pratique de la Régulation et de la Compensation des Compas, avec ou sans Relèvements. Par A. Collet, Lieutenant de Vaisseau, Répétiteur à l'Ecole Polytechnique. Ouvrage publié avec l'Autorisation de M. le Ministre de la Marine. Paris: Challamel Ainé. 1882.

The Admiralty Manual for the Deviations of the Compass—a work which was the outcome of the joint investigations (carried on through several years) of the late Archibald Smith, and the present Hydrographer to the Admiralty, Capt. Sir F. J. Evans—has been translated into most European languages, and it was rendered into

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French twelve years ago by Lieut. A. Collet, the author of this new treatise on the same subject; but the Manual remains the basis of the new work now before us.

In the first place we have thirty pages devoted to the historical part of the subject, which is interesting as far as it goes; but the full history of the investigation into compass deviation has still to be written, and it could only be done in England, where for several years (during the *fifties*) fierce controversies raged between several eminently scientific men.

Next comes an "introduction" of forty-two pages, four chapters of which are devoted to elementary mechanics, and four more to elementary magnetism; taken together the eight chapters are an excellent preparation towards a clear appreciation of what produces the deviation of the compass, and of the method of determining and compensating it.

In the next fifty-eight pages, which form the "first part" with the heading of the "deviation of the compass," the general subject is discussed in full; the action of the ship on the compass; semi-circular and quadrantal deviation; compasses with single and compound needles; the formulæ of deviation; the approximate and exact co-efficients; the method of computing the co-efficients; the heeling error, &c.

The second part, extending over fifty-seven pages, relates to the determination and application of the deviation and error of the compass; the use of Napier's Diagram; and the computations connected with the approximate co-efficients by means of terrestrial and celestial observations alone.

The third part, extending over forty-three pages, is devoted to the several mathematical expressions for the magnetic forces acting on the compass, and their relation to the exact co-efficients.

The fourth part, extending through forty-six pages, illustrates the principles of the method of compass compensation, and strongly advocates the adoption of compensation under all circumstances; in this part the method of Sir William Thomson is contrasted with that of Lieut. Peichl of the Austrian Navy, in which the former uses very short needles, and the latter needles of the usual size.

The fifth part, extending over thirty-five pages, examines the

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various methods of compensation when at sea, and when no observations (terrestrial or celestial) can be had, owing to fog; here the use of the deflector is discussed.

The necessary tables for the computations, and charts illustrative of horizontal force, dip, and variation, conclude the volume.

Lieut. Collet has done full justice to the subject, and has produced a work so complete in itself that there is no need for reference to auxiliary text-books for the purpose of learning first principles in either mechanics or physics. The labours of all who are mentioned are fairly dealt with. The theoretical part of the Admiralty Manual is given succinctly and clearly, so that it can be the more easily mastered, while the practical part is very fully developed. We, however, miss all reference to the compass of Duchemin, an instrument much used in France, and which has been well reported on by many eminent officers in the French Navy,—so at least we learn from the pages of the *Revue Maritime*.

On Sea Sickness. By J. R. Stocker, M.B., London, M.R.C.P. 1882.

Those who are affected by sea sickness when on a trip, whether short or long, may desire to know the various causes to which it has been assigned by different authorities, and the best remedies for either a cure, or a mitigation of some of its worst effects. In this small pamphlet will be found a summary of all that has been written and published on the subject. But as to the cure, we fully believe that there is no medicinal remedy—nor can it be dissipated by drinking or eating. We agree with the author that the only real cure is to learn to accustom oneself to the movements of the ship—to learn in fact to stand upright and balance oneself amidst the pitching, tossing and rolling; the more one's attention can be distracted from one's own condition, and diverted to other things and other people, the less will one feel the disagreeable sensation; what people want is *resolution*. Above all avoid specifics which contain *bromides*, for these only tend to produce mental aberration.

A New Method of Clearing the Lunar Distance. By Sir George Biddell Airy, K.C.B., F.R.S., late Astronomer Royal. London: Printed for the Hydrographic Office, Admiralty. 1882.

We wish to call the special attention of those who are in the habit of taking lunars to Sir G. B. Airy's new method of

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clearing the lunar distance, and to an *accurate* method of correcting the distance for the spheroidal figure of the earth. The *modus operandi* is very simple and can be easily acquired. That it is accurate we may be sure, coming as it does from the well-known late Astronomer Royal. The small pamphlet of fourteen pages only costs *threepence*, and contains the investigation of the problem, with a blank form for the practice.

Annual Report of the Lighthouse Board for the fiscal year, ending June 30, 1881. Washington, U.S.

On July 1, 1881, it appears that there were in operation the following aids to navigation in United States waters, viz., light-houses, 700; lightships, 29; fog-signals operated by steam or hot air, 59; lights established on the Western rivers, 864; automatic whistling buoys, 27; bell buoys, 11; other buoys, 3,284. The report gives details of work past, and now in progress; also an interesting account of the Tillamook Rock light station in Oregon, accompanied by some important meteorological observations made while the lighthouse was being built.

1. *General Report of the Operations of the Marine Survey of India* for the year 1880-81. Prepared for submission to the Government of India, by Commander A. Dundas Taylor (late I.N.), F.R.G.S., Superintendent of Marine Surveys. Calcutta.
2. *List of Lighthouses and Light-vessels in British India, including the Red Sea and Coast of Arabia* (*Suez to Singapore*). Corrected from official information to 1st January, 1882, by Robert C. Carrington, Assoc. Inst., C.E., Marine Survey of India. Calcutta.

From the *Report* we learn that 104½ miles of coast line (in detail) have been surveyed during the season, and 82 square miles of water have been sounded, embracing 1,006 linear miles of soundings. Notices to mariners were issued to the number of 41, together with one hydrographic notice relating to the harbours of Karwar and Bankot; and 10 new charts have been published. The appendix contains some good and important information respecting Goa, Rangoon, and the set and velocity of the tides at False Point harbour.

The *Light List* gives in detail full particulars respecting the 117 lights established between Suez and Singapore.

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TIDE TABLES FOR APRIL, 1882.

Also Ports of Reference for the Constants in the next Table.

Week Day.	Month Day.	LONDON BRIDGE. A.M.	LONDON BRIDGE. P.M.	HULL. A.M.	HULL. P.M.	NORTH SHIELDS A.M.	NORTH SHIELDS P.M.	LEITH. A.M.	LEITH. P.M.	DEVONPORT. A.M.	DEVONPORT. P.M.	DOVER. A.M.	DOVER. P.M.	WESTON-SUPER-MARE. A.M.	WESTON-SUPER-MARE. P.M.	LIVERPOOL. A.M.	LIVERPOOL. P.M.	GREENOCK. A.M.	GREENOCK. P.M.	QUEENSTOWN A.M.	QUEENSTOWN P.M.	KINGSTOWN A.M.	KINGSTOWN P.M.	LONDONDERRY. A.M.	LONDONDERRY. P.M.	BREST. A.M.	BREST. P.M.
		H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
S	1	0 39	0 59	5 8	5 28	2 7	2 24	1 1	1 18	4 6	4 27	9 41	9 59	5 20	5 40	9 58	10 14	10 38	10 56	3 32	3 50	9 52	10 9	6 39	6 56	2 23	2 40
S.	2	1 17	1 33	5 41	5 57	2 40	2 55	1 35	1 51	4 47	5 5	10 17	10 35	5 59	6 17	10 30	10 46	11 14	11 32	4 8	4 25	10 24	10 38	7 13	7 29	2 56	3 12
M	3	1 51	2 6	6 13	6 30	3 10	3 25	2 7	2 23	5 22	5 39	10 53	11 11	6 35	6 53	11 2	11 18	11 50	—	4 42	4 59	10 53	11 8	7 45	8 1	3 28	3 44
Tu	4	2 21	2 36	6 47	7 4	3 40	3 56	2 39	2 54	5 56	6 13	11 29	11 46	7 10	7 26	11 34	11 50	0 7	0 24	5 16	5 33	11 23	11 39	8 17	8 32	4 0	4 16
W	5	2 51	3 6	7 20	7 36	4 12	4 28	3 9	3 24	6 29	6 45	—	0 3	7 42	7 58	—	0 6	0 41	0 57	5 50	6 7	11 55	—	8 46	9 0	4 32	4 48
Th	6	3 22	3 38	7 52	8 8	4 44	5 1	3 39	3 55	7 0	7 15	0 20	0 38	8 14	8 30	0 22	0 38	1 13	1 30	6 23	6 39	0 12	0 29	9 15	9 31	5 4	5 20
F	7	3 55	4 12	8 24	8 41	5 18	5 36	4 12	4 30	7 31	7 47	0 56	1 15	8 46	9 3	0 55	1 13	1 47	2 4	6 56	7 14	0 46	1 4	9 47	10 4	5 37	5 55
S	8	4 30	4 47	9 0	9 21	5 55	6 16	4 49	5 10	8 5	8 24	1 35	1 56	9 21	9 39	1 32	1 52	2 22	2 41	7 34	7 54	1 24	1 45	10 23	10 45	6 16	6 36
S.	9	5 6	5 26	9 42	10 4	6 38	7 1	5 33	5 57	8 43	9 3	2 18	2 40	9 58	10 17	2 12	2 33	3 1	3 22	8 15	8 37	2 7	2 31	11 10	11 41	6 58	7 22
M	10	5 48	6 13	10 29	10 59	7 27	7 57	6 23	6 53	9 26	9 52	3 3	3 28	10 38	11 3	2 56	3 22	3 45	4 11	9 1	9 28	2 56	3 24	—	0 17	7 49	8 20
Tu	11	6 40	7 12	11 35	—	8 32	9 11	7 27	8 5	10 22	10 58	3 57	4 28	11 34	—	3 53	4 29	4 41	5 14	9 59	10 34	3 57	4 35	0 59	1 44	8 53	9 30
W	12	7 46	8 24	0 14	0 54	9 33	10 36	8 46	9 30	11 37	—	5 0	5 36	0 10	0 50	5 9	5 54	5 50	6 31	11 16	mid.	5 14	5 54	2 30	3 13	10 13	10 59
Th	13	9 7	9 53	1 34	2 18	11 18	11 55	10 12	10 48	0 21	1 8	6 15	6 53	1 34	2 14	6 40	7 21	7 14	7 53	—	0 39	6 33	7 9	3 51	4 23	11 40	—
F	14	10 32	11 7	2 49	3 22	—	0 27	11 20	11 50	1 50	2 29	7 31	8 5	2 53	3 30	7 57	8 28	8 29	9 2	1 16	1 51	7 42	8 14	4 50	5 14	0 17	0 49
S	15	11 40	—	3 52	4 21	0 56	1 22	—	0 16	3 2	3 32	8 34	9 2	4 5	4 38	8 56	9 21	9 32	10 0	2 22	2 52	8 44	9 12	5 38	6 2	1 18	1 45
S.	16	0 11	0 34	4 47	5 11	1 47	2 10	0 41	1 5	3 59	4 25	9 28	9 53	5 8	5 35	9 45	10 8	10 26	10 50	3 19	3 44	9 38	10 0	6 26	6 49	2 10	2 33
M	17	0 59	1 24	5 34	5 57	2 32	2 54	1 28	1 50	4 50	5 14	10 18	10 42	6 0	6 25	10 31	10 54	11 14	11 38	4 8	4 32	10 21	10 42	7 12	7 35	2 55	3 17
Tu	18	1 46	2 7	6 20	6 43	3 15	3 36	2 12	2 33	5 37	5 59	11 6	11 30	6 49	7 12	11 16	11 38	—	0 2	4 55	5 18	11 3	11 25	7 57	8 17	3 39	4 1
W	19	2 30	2 51	7 5	7 27	3 57	4 18	2 54	3 15	6 21	6 43	11 54	—	7 34	7 55	—	noon	0 25	0 48	5 41	6 3	11 47	—	8 37	8 56	4 23	4 44
Th	20	3 13	3 34	7 49	8 10	4 40	5 2	3 36	3 57	7 2	7 21	0 17	0 40	8 15	8 35	0 21	0 42	1 10	1 31	6 24	6 45	0 9	0 31	9 16	9 36	5 5	5 26
F	21	3 56	4 17	8 31	8 52	5 24	5 46	4 19	4 41	7 40	7 59	1 3	1 26	8 55	9 14	1 3	1 24	1 52	2 13	7 6	7 27	0 53	1 15	9 56	10 17	5 47	6 8
S	22	4 37	4 58	9 13	9 34	6 8	6 30	5 3	5 25	8 18	8 37	1 49	2 11	9 33	9 51	1 44	2 5	2 34	2 55	7 48	8 8	1 37	1 59	10 38	11 3	6 29	6 51
S.	23	5 19	5 40	9 56	10 20	6 52	7 17	5 48	6 12	8 55	9 15	2 33	2 55	10 9	10 28	2 26	2 48	3 16	3 37	8 28	8 49	2 22	2 46	11 31	—	7 14	7 38
M	24	6 4	6 29	10 46	11 16	7 44	8 13	6 39	7 8	9 37	10 0	3 17	3 40	10 48	11 12	3 11	3 36	4 0	4 25	9 12	9 37	3 11	3 39	0 2	0 27	8 3	8 30
Tu	25	6 54	7 22	11 49	—	8 45	9 20	7 40	8 14	10 27	10 58	4 6	4 34	11 41	—	4 5	4 38	4 52	5 21	10 5	10 38	4 10	4 44	1 16	1 57	9 1	9 35
W	26	7 53	8 26	0 24	0 59	9 58	10 35	8 51	9 29	11 32	—	5 4	5 35	0 14	0 49	5 15	5 56	5 54	6 30	11 15	11 50	5 19	5 53	2 36	3 12	10 12	10 51
Th	27	9 4	9 46	1 33	2 6	11 10	11 42	10 4	10 35	0 11	0 50	6 7	6 39	1 25	2 0	6 35	7 9	7 4	7 38	—	0 24	6 26	6 57	3 44	4 12	11 26	mid.
F	28	10 22	10 53	2 36	3 6	—	0 12	11 5	11 34	1 26	2 0	7 13	7 44	2 34	3 7	7 40	8 10	8 11	8 42	0 58	1 30	7 26	7 55	4 38	5 1	—	0 30
S	29	11 23	11 49	3 35	4 2	0 40	1 4	11 59	—	2 30	2 58	8 13	8 37	3 38	4 7	8 36	8 59	9 10	9 35	2 0	2 26	8 22	8 47	5 22	5 41	0 57	1 22
S.	30	—	0 13	4 25	4 46	1 26	1 45	0 20	0 39	3 24	3 47	8 58	9 18	4 32	4 56	9 19	9 37	9 56	10 16	2 48	3 9	9 9	9 30	5 59	6 17	1 43	2 2

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TIDAL CONSTANTS

For Various British, Irish, and European Ports.

By applying the Tidal Constant of the place, according to its sign (+ *add.* − *sub.*), to the time of high water on the given day at the port of reference, you have the time of high water at the place sought.

Place.	Constant. H. M.	Port of Reference.
Aberdeen	−1 17	Leith
Aberystwyth	−3 52	Liverpool
Alderney	+2 59	Brest
Antwerp	+5 13	Dover
Arbroath	−0 42	Leith
Arcachon	+0 50	Brest
Arklow	−2 25	Kingstown
Ayr	−0 18	Greenock
Banff	−1 49	Leith
Bantry harbour	−1 14	Queenstown
Barnstaple bridge	−0 26	Weston-s.-Mare
Bayonne	−0 2	Brest
Beachy head & Rye bay	+0 8	Dover
Beaumaris	−0 51	Liverpool
Belfast	+2 42	Londonderry
Berwick	−1 5	N. Shields
Blyth	−0 8	N. Shields
Bordeaux	+3 3	Brest
Boulogne	+0 13	Dover
Bridport	+0 22	Devonport
Bristol & King Road	+0 19	Weston-s.-Mare
Cadiz	−2 2	Brest
Caernarvon	−1 56	Liverpool
Calais	+0 37	Dover
Campbellton	−0 23	Greenock
Cardiff	+0 2	Weston-s.-Mare
Cardigan bar	−4 22	Liverpool
Carlingford bar	−0 10	Kingstown
Chatham	−0 47	London
Cherbourg	+4 2	Brest
Coleraine	−1 37	Londonderry
Coquet Road	−0 23	N. Shields
Cordouan Tower	−0 10	Brest
Cowes (West)	−0 27	Dover
Crinan	+4 41	Greenock
Cromarty	−2 21	Leith
Dartmouth	+0 33	Devonport
Deal & Downs	+0 3	Dover
Dieppe	+7 19	Brest
Donaghadee	+0 3	Kingstown
Donegal harbour	+0 17	Queenstown
Douglas & Ramsay	−0 11	Liverpool
Dublin bar	+0 2	Kingstown
Dundalk	−0 16	Kingstown
Dungeness	−0 27	Dover
Dunkerque	+0 56	Dover
Exmouth	+0 38	Devonport
Falmouth	−0 46	Devonport
Fecamp	+6 57	Brest
Ferrol	−0 47	Brest
Flamborough head	−1 59	Hull
Fleetwood	−0 12	Liverpool
Folkestone	−0 5	Dover
Fowey	−0 29	Devonport
Flushing	+1 42	Dover
Galway bay	−0 26	Queenstown
Gibraltar	−1 27	Brest
Glasgow (Port)	+0 10	Greenock
Gloucester	+2 51	Weston-s.-Mare
Granville	+2 26	Brest
Gravesend	−0 48	London
Grimsby (Great)	−0 53	Hull
Guernsey (St. Peter)	+2 50	Brest
Hartlepool	+0 5	N. Shields
Harwich	−1 52	London
Havre	+6 4	Brest
Helgoland	+0 21	Dover
Holyhead	−1 12	Liverpool
Holy Island harbour	−0 53	N. Shields
Honfleur	+5 42	Brest
Inverness	−1 59	Leith

Place.	Constant. H. M.	Port of Reference.
Jersey (St. Helier)	+2 38	Brest
Kinsale	−0 18	Queenstown
Lerwick (Shetland)	−3 47	Leith
Limerick	+1 15	Queenstown
Lisbon bar	−1 17	Brest
Littlehampton	+0 24	Dover
Llanelly bar	−0 38	Weston-s.-Mare
Lowestoft	−4 1	London
Lynn & Boston Deep	−0 29	Hull
Margate	−2 18	London
Maryport	+0 3	Liverpool
Milford Haven entr.	−0 58	Weston-s.-Mare
Montrose	−0 52	Leith
Morlaix	+1 6	Brest
Needles point	−1 26	Dover
Newcastle	+0 23	N. Shields
Newhaven	+0 39	Dover
Newport	+0 16	Weston-s.-Mare
Nieuport	+1 6	Dover
Nore	−1 28	London
Orfordness	−2 43	London
Oporto	−1 17	Brest
Ostende	+1 13	Dover
Padstow	−1 41	Weston-s.-Mare
Peel, Isle of Man	−0 15	Liverpool
Pembroke Dock	−0 42	Weston-s.-Mare
Penzance	−1 13	Devonport
Peterhead	−1 43	Leith
Piel harbour, Barrow	−0 18	Liverpool
Plymouth breakwater	−0 6	Devonport
Poole	−2 2	Dover
Port Carlisle	+0 47	Liverpool
Portland breakwater	+1 18	Devonport
Port Patrick	−0 58	Greenock
Portsmouth	+0 29	Dover
Ramsgate	−2 19	London
Rotterdam	+4 33	Dover
Santander	−0 17	Brest
Scarborough	+0 48	N. Shields
Selsea bill	+0 33	Dover
Sheerness	−1 21	London
Shoreham	+0 22	Dover
Sligo bay	+0 17	Queenstown
Southampton	−0 42	Dover
Spurn point	−1 3	Hull
St. Ives	−2 10	Weston-s.-Mare
St. Malo	+2 18	Brest
St. Mary (Scilly)	−1 16	Devonport
St. Nazaire	−0 7	Brest
Stornoway	+6 38	Greenock
Stromness (Orkneys)	−5 17	Leith
Sunderland	−0 1	N. Shields
Swansea bay	−0 53	Weston-s.-Mare
Tay bar	−0 11	Leith
Tees bar	+0 22	N. Shields
Tenby	−1 12	Weston-s.-Mare
Thurso	−5 49	Leith
Torbay	+0 17	Devonport
Tralee bay	−0 58	Queenstown
Ushant (Ouessant)	−0 15	Brest
Valentia harbour	−1 19	Queenstown
Waterford	+0 19	Queenstown
Westport	−0 4	Queenstown
Wexford	+2 20	Queenstown
Whitby	+0 22	N. Shields
Whitehaven	−0 9	Liverpool
Wick	−2 55	Leith
Wicklow	−0 41	Kingstown
Workington	−0 19	Liverpool
Yarmouth road	−4 48	London
Youghall	+0 13	Queenstown

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MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
113	English Channel — Eddystone New Lighthouse	Latest particulars of light and fog-bell.
114	England—South Coast—Weymouth Harbour	Leading lights for entering.
115	„ St. George's Channel—South Bishop Lighthouse	Proposed fog-bell.
116	„ Bristol Channel — Bideford Low Light	Proposed extension of illuminated arc.
117	North Sea—Hook of Holland Canal	Additional leading lights and buoy.
118	„ Terschelling Bank Light-vessel	Position.
119	„ Weser River Entrance—Light-vessel	Intended temporary withdrawal.
120	Norway — West Coast — Ulle	Fishing light established.
121	Mediterranean—Balearic Islands — Iviza—Port Iviza	New harbour light.
122	„ France—Port Monaco	New harbour light.
123	„ Corsica — N.W. Coast —Vallitone	Sunken rock off the point.
124	„ Gulf of Genoa—Genoa	Bell buoy withdrawn.
125	„ Gulf of Salerno—Cape Orso	Permanent light exhibited.
126	„ Italy—West Coast	Prohibited anchorage near telegraph cable.
127	„ Adriatic — Gulf of Trieste—Port Buso	Arc of visibility of light increased: cable between Trieste and Corfu.
128	„ „ Cape Pomontore—Porer Rock	Intended sectors to low light.
129	„ „ Calamota Channel—Port Slano—Dolnji Point	Light altered in colour.
130	Indian Ocean—Seychelle Islands—Dennis Island	New light.
131	Red Sea—Kamaran Bay	Shoal near south entrance.
132	India — West Coast — Bombay Harbour Sunk Rock	Lighthouse building.
133	Bay of Bengal—Ceylon—N.E. Coast	Obelisk N.W. of "Mark house."
134	Australia—N.W. Coast—Port Darwin—Charles Point	New beacon.
135	„ East Coast—Port Jackson	New leading light.
136	„ Victoria — Port Western — Hastings Jetty	Lights altered in colour.
137	„ „ Port Phillip — Shortland Bluff	Additional sector in low light.
138	South Australia—Spencer Gulf	New light and alterations.
139	„ Tipara Bay—Moonta Bay	New light on jetty.
140	„ Cape Northumberland	Light altered in character.
141	„ Cape Banks	Intended light in 1883.
142	New Zealand — Middle Island — Cook Strait—Tory Channel	Leading lights.
143	South Pacific—Suwarrow Island	Light discontinued; pyramid remains.
144	South America—East Coast—Rio de la Plata	Shoal south of Lobos isle not found.
145	„ BritishGuiana—Demerara River	Buoy marking telegraph cables.
146	West Indies — Guadeloupe — Pointe à Pitre—Mouchoir Carré	New bell buoy.
147	„ Cuba — South Coast — Diego Perez Cay	New light-vessel.
148	United States—Florida—St. John's Bar	New whistling buoy.

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NAUTICAL NOTICES.

All Bearings Magnetic, unless otherwise stated.

113.—ENGLISH CHANNEL.—*Eddystone new Lighthouse.*—With reference to previous Notices on intended alteration in character of light, and of fog-signal at the Eddystone rocks; and on the temporary exhibition of a fixed white light from the new tower at or soon after the end of January, 1882, and thenceforward until the month of March following. Further Notice has been given that at the latter end of March, 1882,* the following alterations will be made:—The light will be a *white double flashing half-minute* light, showing *two successive flashes* of about *two and a-half seconds* duration, divided by an eclipse of about *four seconds*, the second flash being followed by an eclipse of about *twenty-one seconds*. Elevated 133 feet above high water, and visible all round the horizon from a distance of 17½ miles. Also, a *fixed white* subsidary light will be shown from a window in the lighthouse below the flashing light, to mark the Hand Deeps; it will extend over a sector of 16°, from the bearing of S. 32° E. to S. 48° E. Also, during thick and foggy weather, a large bell will be sounded *twice* in quick succession *every half-minute*, thus assimilating the character of the sound signal to that of the light.

Note.—Mariners will observe that the Casquets light, 78 miles S.E. ¼ E. from the Eddystone, is similar in character to the Eddystone light, but shows *three flashes* in quick succession instead of *two*. *Variation*, 19¾° *W.*

114.—ENGLAND.—*South Coast.—Weymouth Harbour.—Bearing of Leading Lights for Entering.*—The leading lights (green) on the north pier at Weymouth, kept in line bearing W. lead into the harbour entrance, until close to the north pier lights. Also, the lights on the north end of the Esplanade, for leading clear of the shoal ground off the south pier, are in line when bearing N. by W. ¾ W. *Variation*, 19° *W.*

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* When going to press we learn that this has been postponed until May.

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115.—ENGLAND.—*St George's Channel.—South Bishop Light-house Fog Bell.*—On or about the 1st June next, during thick or foggy weather, a *bell* will be sounded giving *one single stroke* every *twenty* seconds.

116.—ENGLAND.—*Bristol Channel—Bideford Low Light—Extension of Illuminated Arc.*—It is intended at an early date to extend the lateral range of Bideford *low* light, so that it shall be shown *one point* more to the *eastward* than at present, and *three points* more to the *westward*. Further Notice will be given in due course.

117.—NORTH SEA.—*Hook of Holland Canal.—Additional Leading Lights and Buoy.*—On 16th January, 1882, two additional leading lights were exhibited to indicate the channel over the bar of the west gat, Hook of Holland canal entrance. The lights are fixed *green* lights, only visible seaward in clear weather for a distance of about 2½ miles; they are obscured over outer buoy No. 1 red, and when bearing southward of S.E. by E. ⅓ E., in order to avoid confusion with the tidal lights. The western or low light (K), elevated 33 feet above high water, is shown from a watch-house (provided with a wooden frame-work as a day mark) close to the screen beacon; position, lat. 51° 58′ 50″ N., long. 4° 7′ 0″ E. The eastern or high light (L), elevated 56 feet above high water, is shown from the engineer's station, and bears E. by S. ½ S. from the low light, distant 547 yards. On the same date, the western (C) of the two red leading lights (C, D) was moved 38 yards to the northward, and is now distant about 459 yards from light D: these lights in line bearing S.E. by ½ E. lead just southward of black buoy A of the west gat. Entering the west gat, the green lights (K, L) in line bearing E. by S. ½ S lead through the channel, until the white lights (A, B) on the south shore come in line—indicating—that the red lights (C, D) should then be brought in line as a leading mark for proceeding. Also, in order further to mark the south side of the fairway (in connection with the low dam in course of construction), an additional white buoy B (new) has been placed between white buoys A and B (old); position, lat. 51° 58′ 50″ N., long. 4° 4′ 50″ E. *Variation*, 16¼° *W.*

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118.—North Sea.—*Position of Terschelling Bank Light-Vessel.*—This light-vessel is now moored in lat. 53° 29′ 55″ N., long. 4° 51′ E.

119.—North Sea.—*Weser River Entrance.—Weser Light-vessel.—Intended Temporary Withdrawal.*—On 28th June, 1882, this light-vessel will be withdrawn for repairs, and probably will be replaced in position on 5th July, 1882.

120.—Norway.—*West Coast.—Fishing Light at Ulle.*—On 1st February, 1882, a light was exhibited at the fishing station Ulle (Ulla or Ullahammer), as a guide through the boat channel cut across the bar Ullabarren. The direction of the channel is about N.E. and S.W. The light is placed on the middle line of the channel extension, and shows *red* on the eastern side of the channel; *white* on the western side; and *red* seaward between the bearings of S. by E. (leading one cable westward of Flemsbo or Flemsboen) and S.S.E. ¼ E. (leading one cable eastward of Skaaken). The light will be shown from 25th January to 8th April, and should be visible from a distance of 5 miles. Position, lat. 62° 40′ 25″ N., long. 6° 12′ 30″ E. *Variation*, 17¼° *W.*

121.—Mediterranean.—*Balearic Islands.—Iviza.—Harbour Light at Port Iviza.*—Exhibited on the point (locally known as La Consigna) eastward of the town at port Iviza, S.E. coast of Iviza island: it shows *green* over the channel, and entrance to the port; and *white* towards the town.

122.—Mediterranean.—*France.—Harbour Light at Port Monaco.*—Exhibited from the quay near the old harbour (locally known as Quarantaine); it is a *fixed red* light. Position approximate, lat. 43° 44′ 0″ N., long. 7° 25′ 25″ E.

123.—Mediterranean.—*Corsica.—N.W. Coast.—Sunken Rock off Vallitone Point.*—This danger, about 2½ miles westward of Iles Rousses, on which the Fraissinet Company's steam vessel *Durance* was wrecked in February, 1880, has 3 feet water over it, and lies with the western extreme of Vallitone point bearing S. 46½° W., distant 2 cables. A rock with one foot over it lies S. 32° E., distant half a cable from the Durance rock.

124.—Mediterranean.—*Gulf of Genoa.—Genoa.—Bell Buoy Withdrawn.*—The bell buoy that previously marked the old

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extremity of the new mole at the port of Genoa, is withdrawn, and the bell buoy marking the extremity of the new mole, in course of construction, will be kept in position.

125.—MEDITERRANEAN.—*Gulf of Salerno.—Cape Orso.—Permanent Light Re-exhibited.—Temporary Light Discontinued.*—With reference to Notice dated 7th April, 1879, on the destruction of Cape Orso lighthouse during a heavy gale, and the exhibition of a temporary light:—On 15th January, 1882, the permanent light was re-exhibited from a new lighthouse erected on the extremity of Cape Orso, S.W. of Fuenti anchorage, near Vietri. It is a *fixed and flashing* white light, showing a flash of *six seconds* duration *every twenty seconds;* elevated 219 feet above the sea (5½ feet above the ground), and visible in clear weather—the fixed light from a distance of 13 miles—the flashes from a distance of 20 miles. The light is shown from an octagonal platform of masonry attached to the keeper's dwelling, which, of one storey with square foundation, is painted red. Position approximate, lat. 40° 37′ 50″ N., long. 14° 41′ 0″ E. On the exhibition of this permanent light, the temporary light would be discontinued.

126.—MEDITERRANEAN. — *Italy. — West Coast. — Prohibited Anchorage near Telegraph Cable.*—The telegraph cable laid between Terranova, island of Sardinia, and Orbetello, west coast of Italy, is landed at Marinella Vecchia, gulf of Congianus, and at Canella (Torre Cannelle), mount Argentaro. The landing places are marked by beacons with balls and notice boards. Mariners are cautioned not to anchor in the vicinity.

127.—MEDITERRANEAN.—*Adriatic.—Gulf of Trieste.*—(1.) *Port Buso Light.—Arc of Visibility increased.*—This light now shows as follows:—*white* between the bearings of N. 29° W. and N. 2° W.; *red* between N. 2° W. and N. 65° E.; and again *white* from N. 65° E. to S. 11° W. *Variation*, 11° *W.*

(2.)—*Telegraph Cable between Trieste and Corfu.*—The new telegraph cable laid between Trieste and Corfu, is landed close southward of Miramar (Miramare) castle, about 3½ miles northward of Trieste. From the coast the cable trends in a W.S.W. direction for the distance of 11 miles, and thence S.W. by W. ½ W. Mariners are cautioned not to anchor in the vicinity.

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128.—MEDITERRANEAN.— *Adriatic.— Cape Promontore.— Porer Rock Low Light.—Intended Sectors.*—It is proposed to exhibit two sectors of light in addition to the fixed red light shown from a window of the building below the lighthouse on Porer rock, south-westward of cape Promontore. The red light is shown over Sunk rock through an arc of $11\frac{1}{2}^{\circ}$, the proposed sectors will be—fixed *white* from the eastern limit of the red light towards Fenera islet, and fixed *green* westward of the western limit of the red light—so that, vessels within the sector of white light will be eastward of Sunk rock, and within the sector of green light will be westward of Sunk rock.

129.—MEDITERRANEAN. — *Adriatic.—Calamota Channel.—Port Slano. — Dolnji Point Light. — Alteration in Colour.*—The light exhibited on Dolnji (Donja) point, western side of entrance to port Slano, is now a *fixed white* light, instead of fixed green as previously.

130.—INDIAN OCEAN. — *Seychelle Islands. — Light on Dennis Island.*—In the month of March, 1882, a light will be exhibited from a lighthouse in course of construction on the northern part of Dennis island, Seychelle group : it will show a *fixed white* light, elevated 82 feet above the sea, and visible from a distance of 15 miles. Position approximate, lat. 3° 48′ 0″ S., long. 55° 40′ 0″ E.

131.—RED SEA.—*East Coast. — Kamarán Bay. — Shoal in approach to Southern Entrance.*—A sounding of 5 fathoms was suddenly obtained by H.M.S. *Arab*, when passing Kamarán island on 19th December, 1881, the next cast gave $4\frac{1}{2}$ fathoms, when the undermentioned bearings were taken. Steering a W.S.W. course, $4\frac{1}{2}$ fathoms was found for a distance of 2 cables, when the water deepened to 7, 10, and no bottom at 13 fathoms. West extreme of Kamarán island, N. $\frac{3}{4}$ E. ; Rás el Bayádh, E. $\frac{1}{2}$ N. These bearings place *Arab shoal* in approximately, lat. 15° 14′ 30′ N., long. 42° 29′ E. *Variation*, $5\frac{1}{4}^{\circ}$ *W.*

132.—INDIA. — *West Coast. — Bombay Harbour. — Lighthouse Building on Sunk Rock.*—A lighthouse is in course of construction on the Sunk rock, Bombay harbour. The building is a circular tower, and is intended to be 70 feet high above mean level of lowest ordinary spring tides. It is expected that the masonry

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will be finished about the middle of March, 1882, but the fixed white light will continue to be shown, as hitherto, from the Inner light-vessel, until further notice. Particulars as to the description of the light to be exhibited from the Sunk rock lighthouse, and the simultaneous changes to be made in the Prongs and Kenery island lights, will be notified hereafter.

133.—BAY OF BENGAL.—*Ceylon—N.E. Coast—Obelisk North-West of Mark House.*—Erected on the site of the ruin, about 1½ mile northward of "Mark House," *as a guide for clearing the S.E. end of Point Pedro shoals*, instead of Mark house which is low and very indistinct. The obelisk, 50 feet high, is painted white, and bearing W. by S. clears the dangers of point Pedro shoals in 7 fathoms water. Position, lat. 9° 33′ 35″ N., long. 80° 28′ 30″ E. *Variation*, 1⅓° *E.*

134.—AUSTRALIA.—*N.W. Coast.—Clarence Strait.—Port Darwin.—Beacon on Charles Point.*—Erected on Charles point, western side of entrance to port Darwin. The beacon, 41 feet high, constructed of wood and pyramidal in shape, is 20 feet at the base and 8½ feet at the apex; with 20 feet from the apex downwards covered with galvanized iron, and painted white.

135.—AUSTRALIA.—*East Coast.—Port Jackson.—Leading Lights for East Channel.*—On 20th December, 1881, two leading lights, would be exhibited from lighthouses recently erected in the vicinity of Vaucluse bay, eastern side of entrance to port Jackson. They are *fixed red* lights, and kept in line (or the lighthouses during the day) bearing S. ¼ E. lead through the eastern channel, which has been dredged to not less than 27 feet at low water spring tides.

136.—AUSTRALIA.—*Victoria.—Port Western.—Hastings Jetty Light.—Partial Alteration in Colour.*—The portion of the light on Hastings jetty showing towards the channel, has been altered in colour from white to *red*, and should be visible from a distance of 3 to 4 miles.

137.—AUSTRALIA.—*Victoria.—Port Phillip Entrance.—Shortland Bluff Low Lighthouse.—Additional Sector.*—With reference to Notice on the destruction by collision of Swan spit lighthouse, Port Phillip entrance:—Further notice has been given that on 16th December, 1881, in addition to the present sectors, a sector of *red*

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London, January 26,

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To the Edito

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light would be exhibited from Shortland bluff low lighthouse, Queenscliff, visible between the bearings of about S.W. by W. ½ W. and S.W. by W. ¾ W.—or from Black buoy, No. 1, to Perch buoy, No. 2, at the entrance to West channel. This sector of light is intended as a guide in the fairway from Swan spit to between buoys Nos. 1 and 2, thus, so far, will meet the requirements previously fulfilled by Swan spit lighthouse (recently destroyed); but will not be of service in judging the distance from Shortland bluff reef. Vessels leaving should haul to the eastward when Queenscliff jetty light bears about W. by N., sufficiently to clear Shortland bluff reef. *Variation*, 8½° *E.*

138.—South Australia.—*Spencer Gulf.*—(1.) *Eastern Shoal Light-vessel.—Intended Withdrawal.*—On or about 1st December, 1882, it is intended to withdraw the light-vessel at present stationed north-westward of Eastern shoal, approach to port Augusta.

(2.) *Intended Light on Lowly Point.*—Also, on or about 1st December, 1882, it is intended to exhibit a light from a lighthouse to be erected on Lowly point, western side of entrance to port Augusta. It will be a *revolving* light. Further particulars will be published in due course.

139.—South Australia.—*Tipara Bay.—Light on Moonta Bay Jetty.*—It is a *fixed white* light, visible from a distance of 4 miles. Position approximate, lat. 34° 3′ S., long. 137° 34′ E.

140.—South Australia.—*Cape Northumberland Light.—Alteration in Character.*—On 1st May, 1882, the following alteration will be made:—The light will be a *revolving* light of the first order, showing a *bright flash every sixty seconds;* elevated 150 feet above high water, and visible from a distance of 20 miles. The new lighthouse is erected on a knoll, 418 yards eastward of the old lighthouse; the tower and dwellings are painted white, and are conspicuous from seaward.

141.—South Australia.—*Intended Light on Cape Banks.*—On or about 1st January, 1883, it is intended to exhibit a light from a lighthouse to be erected on the mainland near cape Banks, adjacent to Carpenter rock. It will be a *revolving* light. Further particulars will be published in due course.

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142.—New Zealand.—*Middle Island.—Cook Strait.—Leading lights at Tory Channel Entrance.*—On 1st January, 1882, two leading lights would be exhibited from beacons erected on Alapawa island, Tory channel entrance, Cook strait. They are *fixed white* lights; the low light is elevated 22 feet above high water, and is placed 12 yards from high water mark; the high light is elevated 86 feet above high water, and is distant 166 yards from the low light. The beacons, 21 feet high are pyramidal in shape, and painted white. Position approximate of low light, lat. 41° 12′ 10″ S., long. 174° 19′ 20″ E. These lights kept in line lead through the centre of the entrance to Tory channel. *Variation*, $10\frac{1}{2}°$ *E.*

143.—South Pacific.—*Discontinuance of Suwarrow Island Light.*—The light on Suwarrow (Souwaroff) island is discontinued, but the wooden pyramid with base of masonry, from which the light was exhibited, remains standing. The position of this pyramid is stated to be, lat. 13° 13′ S., long. 163° 10′ W.

144. South America.—*East Coast.—Rio de la Plata.—Unsuccessful search for Shoal Southward of Lobos Isle.*—Reported to lie south from Lobos isle, distant 21 miles:—This shoal (reported as a rock about 9 yards in diameter with $3\frac{3}{4}$ fathoms over it, and 15 fathoms, sand, close around, on which an American vessel was said to have struck in 1877) was searched for by H.M.S. *Rifleman* during the greater portion of five days, between 29th July, and 3rd August, 1881. A further search has been made by H.M.S. *Firefly*, between 12th and 17th December, 1881: Lieutenant Law commanding, reports having twice anchored near the reported position, and with a buoy placed as a mark, to have sounded over and round it for the distance of one mile, without finding any indication of shoal water, the depths being 13 to 15 fathoms. Soundings were also taken in the direction of Lobos isle from the reported position, with regular depths of 14 to 16 fathoms. The shoal will for the present be retained on charts, but its existence in the position assigned must be considered doubtful. *Variation*, 8° *E.*

145.—South America.—*British Guiana.—Demerara River Entrance.—Buoy Marking Telegraph Cable.*—A buoy marking the telegraph cable laid between Georgetown and Trinidad, has been placed at Demerara river entrance. The buoy, painted red,

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and surmounted with staff and flag, is moored with Demerara light-vessel bearing W.N.W., distant about one mile. Mariners are cautioned not to anchor in the vicinity.

Note.—For position of Demerara light-vessel, see Nautical Notice, No. 109, p. 233.

146.—West Indies.—*Guadeloupe.—Pointe á Pitre Approach.—Bell Buoy North Eastward of Mouchoir Carré.*—A *bell* buoy surmounted with a mirror, has been placed north-eastward of Mouchoir Carré, in the approach to the Petit Cul de Sac, Pointe á Pitre. The buoy is moored in 5 fathoms water, with the following mark and bearings :—Bacchus point in line with north extreme of Frégate de Bas islet; Gozier islet lighthouse, N. 73° E.; Manroux islet lighthouse, N. 14° W. Position, lat. 16° 11′ 20″ N., long. 61° 30′ 50″ W. *Variation*, 1° *W.*

147.—West Indies.—*Cuba.—South Coast.—Light-vessel South-eastward of Diego Perez Cay.*—On 27th November, 1881, a light was exhibited from a light-vessel placed south-eastward of Diego Perez cay, near the north-eastern edge of Jardines (Jardanillos) bank, south coast of Cuba. It is a *fixed white* light, elevated 43 feet above the sea, and visible from a distance of 12 miles. The light-vessel, painted black with white streak, and the words *Diego Perez* on her sides, is moored with the following bearings:—The opening between Calvario and Blanco cays, N. 35¾° E.; North-east edge (near) of Jardines bank, S. 30° E.; South extreme of Diego Perez cay, N. 76¾° W. Position approximate, lat. 22° 1′ 45″ N., long. 81° 27′ W.

Note.—Vessels entering Cazones bay, should leave this light-vessel on the port-hand—those proceeding to the westward should leave her on the starboard-hand. *Variation*, 4½° *E.*

148.—United States.—*Florida.—Whistling Signal Buoy off St. John's Bar.*—On or about March 15, 1882, a whistling signal buoy would be moored in place of the present sea buoy, off St. John's Bar, Florida. This buoy is painted with black and white perpendicular stripes; marked "St. J.," and surmounted by a whistle operated by the motion of the sea, and giving blasts at short intervals.

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CHARTS, &c., PUBLISHED BY THE HYDROGRAPHIC DEPARTMENT, ADMIRALTY, IN JANUARY AND FEBRUARY, 1882.

No.		s.	d.
1291	South America, west coast :—Pisco bay	0	6
435	West Indies :—Ports and anchorages at eastern end of Cuba—Ports Niquero ; Escondido or Hidden harbour ; Cueva ; Aguacate ; Navas ; Sigua ; Boma ; Mata ; Bay ; Baracoa and Miel bay ; Maravia ; Baitiqueri ; Taco ; Cayaguanique. Yumuri ; Guanito bays. Limones river. Naguarage	1	6
1244	Fiji islands :—Levuka harbour	1	0
205	Japan :—Nanao harbour	1	6
2119	Australia, east coast :—Newcastle harbour... ...	2	6
136	Bay of Bengal :—Hoogly river—Calcutta to Saugor point	2	6
198	Italy, south coast :—Policastro to cape Sta Maria di Leuca, including the strait of Messina. (Plans, port Cotrone. Cape Rizzuto anchorage. Cotrone and cape Colonne anchorages)	2	6
452	Japan :—Yezo island, with the adjacent straits of Tsugar, La Pérouse, and Yezo	2	6
2286	Sea of Marmara :—Approach to the Bosporus from Stefano point to Prinkipo channel, including Princes islands	2	0
97	Pacific ocean, Solomon islands :—Coughlan harbour. Barranago harbour	0	6
224	Mediterranean :—sea of Marmara	4	0
55	New Britain :—Matava bay. Port Weber. Kabakadai bay	0	6
885	West Indies :—Guadeloupe, with the adjacent islands Saintes, Marie-Galante, Désirade ...	2	0
2348	North America, west coast :—Sitka harbour and approaches	1	6
338	New Caledonia :—Pouebo ; Yengen, ports. Ugue ; Ba ; Kuaua ; Buru ; Nékété and Lavaissière, bays	1	6

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No.		s.	d.
2219	England, south coast:—Needles channel, with Christchurch bay...	2	6
2556	France, north coast:—Calais	1	0
996	Plan added. Shimidsu harbour.		

CHARTS THAT HAVE RECEIVED IMPORTANT CORRECTIONS.

No.

253*a*. Gulf of Aden :—Jibul Jarne to Sayara.
1183 England, west coast :—Kenfig river to Nash point.
101 Japan :—Anchorages in Awomori bay.
52 Ireland, east coast :—Wicklow roadstead.
386 Africa, west coast :—Princes, St. Thomas, and Anno Bom islands.
2760 Sumatra, west coast :—Acheen head to Tyingkokh bay.
2154 England, south coast :—Newhaven.
1674 Australia, east coast :—Brisbane river.
447 Australia, north coast :—Western approaches to Torres strait.
830 India :—Bay of Bengal, east coast.
2300 Baltic sea :—Stierno point to Umea lighthouse, and Sodra Biorko to Eugmo.
2301 Baltic sea :—Umea light to Tome point, and Eugmo to Tauvo.
666 Africa, east coast :—Mombaza islands and ports.
2820 Gulf of Mexico :—Pensacola bay.
2265 Central America, west coast :—Parida to gulf of Nicoya.
1577 North America, west coast :—Columbia river.
263 North America, east coast :—Cape St. Charles to Sandwich bay.

HYDROGRAPHIC NOTICES RECENTLY PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, 1882.

No.

1.—NEWFOUNDLAND PILOT. Relating to St. Lewis sound; and to other portions of the north-east coast of Labrador.

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No.

2.—Bay of Bengal. Relating to False point anchorage, and to the coast of Siam.

3.—South America Pilot, Part II. Relating to Le Maire strait, also to Magellan strait, and channels leading northward therefrom to the gulf of Peñas.

4.—China Sea Directory, Vol. III. Relating to Stonecutters anchorage and Cosmopolitan dock, Kowloon peninsula, Hong Kong.

Books.

	s.	*d.*
Australia Directory, Vol. III. North, north-west, and west coasts, from the gulf of Carpentaria to cape Leeuwin, with directions for passages through the neighbouring seas. Second edition, 1881	4	6

OUR OFFICIAL LOG.

Official Inquiries at Home, 1882.

1263. *Ardanmor*, s.s.; built at Sunderland, 1876; owned by Maclaren, Crum, and Co.; tonnage, 474; Dunkirk to Greenock; sugar; supposed to have foundered at sea. Inquiry held at Westminster, February 15, 1882, before Rothery, Wreck Commissioner; Knox and Grant, N.A. Probably foundered in gale of November 27 last.

1264. *Marguerite*, s.s.; built at Port Glasgow, 1872; owned by Mr. R. Barnwell and others; tonnage, 295; Glasgow to Algiers; coals; abandoned about 100 miles W. by S. of Scilly, January 6, 1882. Inquiry held at Glasgow, February 17, 1882, before Swan and Smith, Justices; Parfitt, Curling and Hallett, N.A. Abandonment justifiable.

1265. *Sarco*, barque; built at Stockton, 1876; owned by Mr. T. R. Shallcross and others; tonnage, 819; Tyne to Valparaiso; coals; abandoned at sea, September 7, 1881. Inquiry held at

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North Shields, February 16, 1882, before Spence and Baker, Justices; Forster and Powell, N.A. Vessel struck with a succession of heavy seas, throwing her on her beam ends, and causing the cargo to shift bodily over to leeward. Abandonment justifiable.

1266. *Culzean*, ship; built at Port Glasgow, 1871; owned by Messrs. Kerr; tonnage, 1,633; Dundee to Glasgow in tow of s.s. *Conqueror*; ballast; lost in Sound of Jura, November 21, 1881, when great loss of life ensued. Inquiry held at Liverpool, February 20, 1882, before Raffles, Judge; Burney, Castle and French, N.A. Loss caused by the hawser parting, and the vessel being then driven on to the rocks.

1267. *Bruce*, s.s.; built at Maryhill, 1876; owned by Mr. G. McFarlane; tonnage, 45; Irvine to Port Dundas, Glasgow; manganese waste; foundered near Irvine Bar, January 27, 1882, when loss of life ensued. Inquiry held at Glasgow, February 22, 1882, before Gilchrist and Scott, Justices; White, Beasley, and Parish, N.A. Loss due to the shifting of the cargo, causing vessel to capsize.

1268. *Scio*, brig; built at Hylton, 1839; owned by Mr. J. B. Bushell; tonnage, 265; the Tyne to Copenhagen; coals; beached near Kirkcaldy, November 27, 1881. Inquiry reheard February 13, 1882, before Green and Cleugh, Justices; Beasley and Anderson, N.A. Former decision upheld as regards master and mate, but reversed as regards the sum to be paid by the owner towards costs of inquiry. Assessors did not concur in the latter portion of decision. (See No. 1,220, February Number.)

1270. *Sarah Mandell*, barque; built at Sherbrook, N.S., 1860; owned by Mr. H. F. Craggs; tonnage, 481; Pensacola to Dordtrecht; pitch pine; supposed to have foundered at sea. Inquiry held at Westminster, February 24, 1882, before Rothery, Wreck Commissioner; Harland and Methven, N.A. No evidence as to cause of loss.

1271. *Saxon Monarch*, s.s.; built at Stockton-on-Tees, 1879; owned by the Royal Exchange Shipping Company; tonnage, 1,172; Odessa to Antwerp; grain; supposed to have foundered at sea. Inquiry held at Westminster, February 21, 1882, before

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Rothery, Wreck Commissioner; Pickard, Murdoch, Merrifield, N.A. Vessel overladen. No evidence as to cause of loss.

1272. *Spartan*, barquentine; built at Bideford, Prince Edward's Island, 1873; owned by Mr. J. A. Nicholson; tonnage, 294; Bull River to Birkenhead; phosphate rock; abandoned at sea, January 18, 1882. Inquiry held at Westminster, February 22, 1882, before Rothery, Wreck Commissioner; Hight, Rees and Merrifield, N.A. Abandonment justifiable.

1273. *Her Majesty*, barque; built at South Hylton, 1868; owned by Mr. G. Lister; tonnage, 350; Trinidad to Dieppe; asphalte; abandoned at sea, December 16, 1881. Inquiry held at Westminster, February 20, 1882, before Rothery, Wreck Commissioner; Donaldson and Hyde, N.A. Vessel unseaworthy; master to blame for taking her to sea, but not for abandoning her at the time he did. Master's certificate not dealt with.

1274. *Iona*, s.s.; tonnage, 618; London to Leith; general cargo; stranded on Herwit Rock, Firth of Forth, February 2, 1882. Inquiry held at Leith, February 27, 1882, before Wilson and Wilkie, Justices; Ward and Hyde, N.A. Master to blame for negligent navigation. Certificate suspended for six months; recommended for one as mate during that time.

1276. *Affigo*, schooner; built at Knottingley, 1865; owned by Mr. J. Rhodes; tonnage, 86; Goole to Teignmouth; coals; supposed to have foundered at sea. Inquiry held at Westminster, March 1, 1882, before Rothery, Wreck Commissioner; Forster and Wilson, N.A. Probably foundered during a heavy gale which occurred soon after she left Goole.

1283. *Rosebud*, s.s., and *Lady Olive*, s.s.; the former built at Wallsend, 1878; owned by Messrs. P. Rowe; tonnage, 466; Newport to Lisbon; coals; the latter built in 1879; owned by the British and Irish Steam Packet Company; tonnage, 596; Falmouth to Dublin; general cargo; in collision off the Longships, when the *Rosebud* foundered, and loss of life ensued. Inquiry held at Cardiff, March 8, 1882, before Jones, Judge; Aplin, Castle and Anderson, N.A. Collision caused by careless navigation of the *Rosebud*. Master in default for leaving his ship at night in charge of an incompetent man. Certificate suspended

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for three months. First and second mate of *Lady Olive* also in default for not carrying out master's orders. Certificates suspended for six and three months respectively.

1284. *Maria and Elizabeth*, snow; built at Sunderland, 1849; owned by John Scott and another; tonnage, 196; Seaham to Southampton; coals; supposed to have foundered at sea. Inquiry held at Sunderland, March 14, 1882, before Ritson and Wilson, Judges; Grant and Castle, N.A. No evidence before Court as to cause of loss.

1285. *Portugalete*, s.s.; built at Jarrow, 1877; owned by Messrs. J. A. Gibbs and Co.; tonnage, 370; Portugalete (Bilbao) to Cardiff; iron ore; abandoned and lost in the Bristol Channel, February 21, 1882. Inquiry held at Cardiff, March 13, 1882, before Jones, Judge; Beasley and French, N.A. Master in default for careless navigation and for neglecting the lead. Certificate suspended for three months.

Official Inquiries Abroad, 1881-2.

1262. *Delaware*, barque; destroyed by fire and abandoned, November 25, 1881. Naval Court held at Valparaiso, December 26, 1881. Fire caused by spontaneous combustion.

1269. *Brisbane*, s.s.; lost on Fish Reef, Northern Territory, October 9, 1881. Inquiry held at Port Adelaide, October 27, 1881. Master free from blame.

1275. *Forward Ho*, barque; lost on rocks, south of Miyako Bay, Niphon. Naval Court held at Kanagawa, December 27, 1881. Ship while in a disabled condition set on shore by the current in a dead calm. Master free from blame.

1277. *Calcutta*, s.s., and *Salamut Savaye*, dinghy. In collision in Bombay Harbour, November 4, 1881, when the dinghy foundered. Master of dinghy to blame for unnecessarily standing across the steamer's bows.

1278. *Moravian*, s.s.; lost on Flat Island, Nova Scotia, December 30, 1881. Inquiry held at Yarmouth, N.S., February 15, 1882. Loss due to a strong current setting the ship on the land. Master exonerated.

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1279. *John Davie;* damaged by fire whilst in Chittagong River, November 25, 1881. Inquiry held at Chittagong, December 14, 1881. Fire due to accident.

1280. *Rodondo*, s.s., and *Woodville*, barque; in collision off Port Jackson, December 6, 1881. Inquiry held at Sydney, December 19, 1881. Master of *Woodville* to blame for showing no light over his stern when hazy weather came on. Certificate not dealt with.

1281. *Glimpse*, barque; abandoned at sea. Inquiry held at Sydney, December 19, 1881. Abandonment justified.

1282. *True Blue*, Ketch; lost while entering Tweed River. Inquiry held at Sydney, December 19, 1881. No evidence adduced on which to found a charge against the master.

MARINE INVENTIONS.

Monthly List of Patents—Compiled for this Journal by Messrs. W. P. Thompson and Boult, British and International Patent and Trademark Agents and Consulting Engineers, 323, *High Holborn, London, W.C.; and Berridge Street, Leicester; also by Messrs. W. P. Thompson & Co.*, 6, *Lord Street, Liverpool.*

ENGLISH (APPLICATIONS).

NEW PATENTS.

787. William Henry Duncan, of Colebrook Dale, Salop. "Improved apparatus for guarding and protecting ships."

843. John Arthur Wilkinson and Nicholas McDonnell, both of Folkestone, Kent. "Improvements in apparatus for detaching ships' boats when lowered."

859. Thomas Lambert, of Plymouth. "Improvements in screw propellers."

871. Thomas Davison, of Glasgow. "Improvements in apparatus for showing the speed of ships."

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878. Thomas Heppell, of Birtley, Durham. "Improvements in the construction of screw propellers."

962. John Hawks Clasper, of Oxford and Wandsworth. "Improvements in supports for rowlocks for outrigger boats."

992. John Cooke, of Howe Villa, Richmond, York. "Improvements in apparatus for propelling and steering ships or vessels."

1022. Walter Blythe, of 7, Rumford Street, Liverpool. "Improvements in elevating apparatus chiefly designed for discharging grain from ships."

1053. Max Emil Theodor Bülow, of Hamburg, Germany. "Improvements in apparatus for supporting and disengaging ships' boats."

1056. John Pyndar Wright, of Redhill, Surrey. "Improvements in collapsible or folding boats."

1072. Thorsten Nordenfelt, of St. Swithin's Lane, London. "Improvements in carriages for naval and field ordnance."

1073. John Elsie Mouland, of Roby, Lancaster. "Improvements in steamships or vessels propelled by self-contained power."

1083. Julis Pintsch, of Berlin, Germany. "An Improvement in floating lights." (A communication.)

1112. John Shields, of Perth, N.B. "Improvements in means or apparatus for the protection of harbours and shipping."

1125. Francis Lebacq, of 6, Rue du Nord, Bruxelles, Belgium. "An improved system of suspension for beds and seats to prevent sea-sickness on board of ships."

1204. Pierre Malhirbe, of Nantes, France. "Improvements in apparatus for saving persons and goods at sea." (A communication.)

AUSTRIAN.

A. Figge, G. A. Höttgen, and H. Wedekind, of London. "A rudder."

CANADIAN.

18623. Reginald H. Earle, of St. John's, Newfoundland. "Improvements in apparatus for lowering and raising boats on vessels."

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FRANCE.

143748. Merkl. "Mechanism for propelling vessels."

143777. MacEvoy. "Improvements in portable torpedoes."

143913. MacEvoy. "A circuit closer for vigilant torpedoes."

143957. Kilbourn and Fossick. "Apparatus for operating rudders."

144073. Menge. "A dredger."

GERMAN.

17358. R. Whitby, of Kent (England). "A life-buoy."

PATENTS PUBLISHED (ENGLISH).

3065. July 13th, 1881. Price 6d. Brydges, a communication from Johaan Benedict Merkl, of the City of Berlin. "Improvements in mechanism for propelling ships and other vessels." This invention relates to mechanism which is to replace the screws and paddle-wheels heretofore in use. The said mechanism consists of a considerable number of oars or paddles with suitable flaps, the latter opening when the paddles or oars move forward, but press against the water when moved towards the stern of the vessel. These paddles are preferably placed at about 3 feet (and not more than 6 feet) from the vessel, and below the water-line. If desired a channel may be provided in the vessel, the above-mentioned paddles being placed in the centre.

3135. July 19th, 1881. Price 6d. William Morrison and Christopher Norfolk, of the Town and County of Kingston-upon-Hull, Engineers. "Improvements in screw propellers for navigable vessels." According to this invention the screw may have any desired pitch, each wing or blade is cast separate, and has a narrow boss with a lug or flange, bolts or pins passing through the flange or lug serve to secure the blades (preferably one behind the other) on the shaft. Should a blade become broken, the broken one only need be replaced.

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GENERAL.

THE SUEZ CANAL.—A special correspondent of the *Times* says—"The canal is not big enough for the present traffic. Shipping to the extent of over 3,000,000 of tons passes through every year and it is steadily on the increase. Ships have to wait their turn and much valuable time is wasted at either end and in the passage. The accommodation may be increased in two ways. The whole length of the canal may be widened so as to allow of ships passing each other everywhere. Such a work would not be difficult, but it would be very costly. The deep water passage would have to be more than doubled in width, as the slow speed makes steering difficult, and ships in passing would require plenty of sea-room to avoid accidents. The present width of twenty-five yards would have to be raised to sixty, but it would not be necessary to increase the width of surface of the whole waterway, which is already one hundred yards from bank to bank. The second mode of increasing the facilities of passage is more feasible and has much to recommend it. It consists in a considerable increase of the number of *gares* or passing-places and in the lengthening of those already in existence. There are at present thirteen, and they might easily be increased to twenty. The same precautions now practised would be still enforced in the passing of ships. The block system would be carried out from *gare* to *gare*. The buoying of the passage is already excellent and there would be no increase in the danger of fouling and jamming. The consequences of such accidents in so narrow a water-way as the canal, are so serious that I think, on the whole, the increasing of the *gares* is most to be recommended. But one or other improvement is necessary."

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THE

NAUTICAL MAGAZINE

FIFTY-FIRST YEAR.

VOLUME LI.—No. V.

MAY, 1882.

THE INSTITUTION OF NAVAL ARCHITECTS.

THE annual session for 1882 commenced on the 29th of March by the reading of the annual report, which was of a satisfactory character. Lord Ravensworth, the President, in his opening address referred at length to the wonderful and unprecedented prosperity of the shipping trade of Great Britain, and to the fact that although the year 1880 showed a great advance in shipbuilding, 1881 had been better still.

The first paper was :—

ARMOURED SHIPS AND MODERN GUNS, BY MR. J. D'A. SAMUDA.

In his inaugural address as President of the Institution of Civil Engineers in January last, Sir William Armstrong has attempted to prove that armour-clad ships should be treated as obsolete, and has advocated the building in their place of unarmoured vessels of great speed, carrying armour piercing guns. The effect of the acceptance of this view by the Admiralty, and its practical development, would involve such disastrous consequences that it is most important that Sir William's argument should be at once answered. Those arguments may be thus stated :—

To resist the most powerful guns afloat, armour 2 ft. thick is required, and consequently the area of armour surface is and

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will be much restricted. Even if armour afforded a complete defence against guns it would not be worth its cost, seeing that vessels are still exposed to danger from rams and torpedoes and are liable to be lost by casualties other than those of war. Coal-bunkers may be in some measure substituted for iron armour. An ironclad is much more vulnerable as compared with an unarmoured ship than is commonly supposed, while, for the cost of one of the former we could have three of the latter, each of far higher speed and of equal armament to that of the ironclad. In illustration of this, Sir William describes an imaginary conflict between three such vessels and an ironclad, awarding the victory to the former. He further alleges that our Navy is in point of numbers miserably inadequate, that we can only increase the numbers by diminishing the cost of each ship, and the readiest way of so doing is to dispense with armour. Nor can we rely upon improvised merchant vessels to act as cruisers, while the possession of proper cruisers would be of immense importance to us seeing the enormous property we have at sea and the extent to which we are dependent for our food supplies upon sea-borne produce.

The author of the paper entirely agrees in the last proposition, the importance of cruisers cannot too much be insisted on knowing as we do that we never have more than four months' food in the country, and the terrible straits we must be reduced to, if from any cause a stoppage of our imported supplies were to take place.

Sir William does not make sufficient allowance for the efficiency of steel-faced armour, since even if pierced the fragments do not as in the case of iron armour break off; and the damage is to a large extent limited to the hole pierced. The ironclad also in virtue of her greater size has a steadier gun platform. Armour protection is even now obtained for the vital parts, for steering apparatus, and engines and boilers; in full powered cruisers it is neither possible to place the machinery so far below water as to be secure from damage, nor can efficient protection be given by coal bunkers. Further, the ironclad can only be injured by the heaviest guns, the unarmoured cruiser is vulnerable to light guns which might be carried in large numbers by ironclads. Passing

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over other minor considerations, the crucial point is that the functions to be performed by swift-armed cruisers and the armour clad fleet are *not* the same, the services required from them are really altogether different, and in practice Mr. Samuda believes it will be found absolutely impossible with cruisers, however numerous, to perform the service for which the ironclad fleet is specially required. Cruisers will be available to protect our commerce, to lend assistance to our colonies, and to perform other secondary service; and to do this efficiently we require very many more than we have at present; but they will be wholly unfitted to fight in line of battle, and stand up against an armour-clad fleet, where endurance alone will determine the result of the encounter, and where the endurance of the ironclad fleet may be reckoned by hours against minutes on the part of the unarmoured cruisers, for really no decisive victory could be hoped for against an ironclad fleet by vessels whose safety, when hardly pressed, would only be secured by their running away. The functions of the ironclad fleet would be, to attack in line of battle the enemy's fleet wherever found; to drive it from our shores, and home seas, to follow it, and confine it to its own harbours, to protect our great Naval arsenals, and to oppose all attempts to land troops on our coast.

Mr. Samuda is of opinion that neither in ironclads nor crusiers do we at present possess anything like the fleet demanded by our position and peculiar dangers. The money difficulty is great, but insignificant in comparison with the magnitude of the issues involved. Sir William Armstrong's warning on this head is most significant. He points out that there is no country so likely to excite the greed of an assailant as our own, or so vulnerable in relation to commerce; that war indemnities have degenerated into mere exactions proportioned to the wealth of the vanquished, and England, being the richest of nations, offers the highest premium for successful attack. An addition of two or three millions of money to our yearly expenditure for new ships is a small thing, in comparison with such great risks. It is to be hoped that discussion of the subject will assist in convincing the Naval authorities, and the House of Commons, that instead of suppressing ironclads, a great increase in both ironclads and unarmoured

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cruisers is indispensable for securing the position that this country has possessed, and the prosperity that has resulted from it, from time immemorial.

In the discussion following the paper, Admiral Sir G. Hornby said that all the lessons of war past and present showed that a scattered force could not contend against a concentrated force. If an armoured ship were attacked by three unarmoured ships, she would attack them one after another in order to ram them. They dare not risk close quarters, and at a distance they could not hit her effectively. If they could only realise the effect that would be produced by the explosion of a single shell carrying a bursting charge of 37 pounds of powder between decks in a ship, they would hear no more of unarmoured men of war.

Captain Noel, R.N., considered that the English Navy ought to be equal in power to any two foreign navies. In 1866 we had 180,000 tons of armoured ships and the rest of the world 240,000, whereas in 1881 we had 380,000 tons while the rest of the world owned 900,000 tons. It was worth notice that, ton for ton, unarmoured cruisers cost just as much as ironclads, they are only cheaper because they are smaller.

Mr. N. Barnaby, C.B., the Director-General of Naval Construction, remarked that unarmoured ships could not be effectually protected by coal, although, if properly placed, it was of considerable service in that respect. A large number of bulkheads may render a ship nearly unsinkable, but for all that, the vessel may, by the filling of some one compartment, or two adjoining compartments, get a dangerous heel or be so much out of trim as to be unmanageable. If certain work can only be done by big, costly ships, we must have them, and if the work were well done, they were cheap at any price. If he was told that he might do the best he could with 10,000 tons displacement, he would reply "for every additional 100 tons you give me you shall have a better ship," and to this there was no limit. As to the question of speed, he might cite a suggestive fact. They had recently heard of a merchant ship which, with a displacement of 8,000 tons and 8,400 indicated horse power, had attained a speed of 18½ knots. Her Majesty's despatch vessel *Mercury* had steamed at 18¾ knots,

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with a displacement of 3,700 tons and 7,500 indicated horse power. The merchant steamer was 420 feet long, while the *Mercury* for reasons which would be appreciated by naval men, was but 300 feet long. The merchant steamer had about one horse power per ton of displacement, while the *Mercury* required nearly two horse power per ton to get the same speed, This would illustrate the gain to be had by using a big ship.

On Modern Merchant Steamers, by Mr. James Dunn of the Admiralty.

Mr. Dunn began by remarking upon the great advances made in recent years in our Mercantile Marine, observing that it is very difficult to realise how great those changes have been.

In 1850, only 12 per cent. of the effective tonnage (*i.e.*, carrying power) of our merchant navy was steam tonnage ; in 1880, 62 per cent. While the carrying power of our sailing ships had increased less than 60 per cent. (which increase, moreover, occurred almost entirely in the first ten years of this period) the carrying power of our steamers had increased 1,750 per cent.

The diminution in the number of sailing ships which has been going on for some years past has obtained in all classes, with one striking exception. There has been an increase of about 50 per cent. in sailing ships of from 1,400 to 2,000 tons, indicating a belief that for some years to come it will be possible to economically use such vessels on long distance trades. As regards material in 1880, only 20 per cent. of the tonnage built in the British Empire was wood, and less than 5 per cent. of that built in the United Kingdom. In 1881 there was double the amount of steel tonnage built as compared with 1879.

During the thirty years, the carrying power of foreign nations has increased by 250 per cent., ours by 380 per cent. The total value of British shipping is now estimated at one hundred and fifty to two hundred millions sterling.

Remarkable progress has been made in some trades. In the direct trade with the United States from 1850 till 1862, two-thirds was done by American shipping. In 1880 the total trade is three times as much, but only one-fourteenth of it is done by

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American vessels, seven-ninths being in British hands. In the East India trade foreign vessels do just about the same as 25 years ago, but the trade in our own vessels is seven times as much as it was then. It would appear, that at all events, for some time, this increase in our carrying trade is likely to be continued.

After adverting to the fact that our large carrying trade was our most vulnerable point in the event of war with a maritime power, Mr. Dunn went on to consider whether and to what extent merchant steamers might themselves be made available for the protection of our commerce. Having seen very much of merchant steamers within the last six years, he was able to put before the Institution information regarding changes, which, though they have mostly come about for strictly commercial reasons, have undoubtedly affected in a remarkable degree their capabilities for modern fighting.

1. *Speed.*—Between 1875 and 1882 the number of steamers having ocean speeds of 13 knots and upwards has increased from 25 to 65. Of these 10 were of 14 knots and upwards, now there are 35. The highest speed was then 15 knots; now we have several steamers with speeds approaching 17 knots. This increase in speed among first-class steamers is the more noticeable, because the average speed of merchant steamers has not advanced at a corresponding rate.

2. *Coal Endurance.*—The gradual improvement of marine engines has had the effect of enabling steamers to run for much longer periods than formerly without re-coaling. There are now many steamers of moderate dimensions which can carry sufficient coal to steam round the world at a 10-knot speed. In the Cape Mail service there are ten such vessels, and four more building.

3. *Strength.*—Among other things the introduction of double bottoms and the more general employment of complete steel and iron decks, have increased the longitudinal strength of merchant steamers. A direct experiment was made in 1878, which appears to have settled the question as to the suitability of merchant steamers for war purposes in this respect. The Admiralty purchased the *Hecla*, then building at Belfast, for the Atlantic

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trade,* and without any additional strengthening she was armed with five 64 pounders, and one 40 pounder, on truck carriages, and having been fitted as a merchant steamer would be for war purposes, she was sent on a trial cruise, with a complement of officers and men from the Royal Navy. She was favourably reported on, except as regards her handiness, in which respect she was at a disadvantage as compared with the shorter ships of the Royal Navy. It may be added, that an Irish cattle boat in the hands of the Chilians was armed with an 8-in. 11 ton gun, and was employed in the bombardment of Peruvian ports.

4. *Watertight Subdivision.*—Mr. Dunn goes at some length into the question of the value of bulkheads, concluding that to ensure a vessel from sinking immediately after a collision she should have not less than five bulkheads. Much improvement in watertight subdivision has been made in steamers built within the last few years. It was often the case some years ago, that bulkheads were arranged so as to give the minimum amount of safety on the given weight of iron. In some ships the great care exercised in making watertight doors in the 'tween decks was thrown away by cutting large open doorways in the hold. Bulkheads, with elaborate sliding doors in the hold, had their tops below the water level. Some vessels had as many as ten or twelve bulkheads, of which but one was of the slightest use in collision. Now there are no first-class mail steamers built which have not efficient watertight subdivisions. To answer the objection that bulkheads cannot be relied upon, Mr. Dunn refers in detail to a number of recent cases of collision, in which vessels struck in such a position that one of the largest compartments was filled with water, were, nevertheless, brought into port or docked safely.

5. *Altered Proportions.*—Of late years the breadths of new merchant steamers are much larger in proportion to other dimensions than formerly. This change is important as regards their suitability for war purposes, because the shorter ships are handier ones. In the second place, they have presumably greater stability, and in

* For the British Shipowners' Company, and intended for passenger trade between Liverpool and Philadelphia.

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the third place, the increase of beam makes it possible to place a block of coal of considerable thickness at the sides of those portions of the machinery which are above or near the water line. It has been ascertained by experiment that the coal in an ordinary bunker will stop shells from the heaviest guns now in general use in unarmoured war vessels, and a few loose armour plates might be used to stop shells from even more powerful guns.

6. *Manœuvring Power.*—This has been increased by the introduction of steam steering-gear. It would also appear from the fact that three large twin-screw steamers were built last year and that two are now building, that this class of vessel is likely to be more numerous in the future. The chief objection to them is the difficulty of docking, but it must be remembered that they secure a practical immunity from the perils of machinery breakdowns in mid-ocean, and a reliable steering apparatus in reserve.

In the course of the discussion which followed Mr. Dunn's paper, Mr. Parker, of Lloyd's, cited the case of a large twin-screw steamer which, on a voyage from San Francisco to Liverpool, made twelve knots an hour, till, when she reached Cape Horn, one of her engines broke down, after which she, with one engine only, made nine knots until the line was reached, by which time the engineers had repaired the other engine.

On the Triple Expansive Engines of the s.s. "Aberdeen," by Mr. Kirk.

After some preliminary remarks upon the advantages resulting from the use of high pressure steam and the compound engine, and an account of the fitting of the three cylinder compound engine to the s.s. *Propontis*, Mr. Kirk described the engines of that type now building by his firm, Messrs. R. Napier and Sons, of Glasgow, for Messrs. George Thompson and Co., and intended for employment in the Australian and China trades.

The *Aberdeen* is an iron ship of dimensions:—length, 350; breadth, 44; depth, 33. The three cylinders are of diameters respectively, 30 in., 45 in., and 70 in., by 4 ft. 6 in. stroke. There are two steel boilers, with a total heating surface of 7,128 square feet and no superheater, the boilers being constructed for a pressure

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of 125 lbs. per square inch. When the ship was completed a trial run of four hours was made, with the result of a consumption of 1·28 lbs. of coal per indicated horse power against the 1·5 to 1·6 lb. which from usual experience might have been expected.

On the Economy of Compound Engines, by Mr. W. Parker, of Lloyd's Registry.

After remarking upon the continued increase which has been made of late years in steam pressures in the boilers of merchant ships, from the 60 lbs. of a few years ago to the 80 or 90 lbs. per square inch with the two cylinder engine at present in use, Mr. Parker went at some length into the *raison d'etre* of the compound engine. First remarking upon the importance of taking full advantage of the expansion of steam, he showed that when the whole of that expansion takes place in a single cylinder, heat is lost in warming the cylinder, as the steam enters at a high pressure. This heat is returned to the steam during the exhaust, which it retards, and thus becomes a double loss. When the expansion of the steam takes place in two cylinders, the loss due to this cause is lessened, but there is, on the other hand, loss owing to the steam having to pass from the high pressure cylinder to the receiver, and from the receiver to the low pressure cylinder. Although a very considerable loss may thus be shown to take place in the best designed compound engine, yet the fact has been proved beyond question that the compound engine, even with this drawback, is more economical by far than the simple engine; and the reason that it is so is because, by expanding the steam into two cylinders, the range of temperature becomes divided into two, and in neither cylinder does such a great amount of condensation take place.

In an ordinary compound engine, as we increase the pressure, so also do we at the same time increase the range of temperature; and further, unless the high pressure cylinder is made unduly large, so that a long range of expansion takes place in it, a large amount of unbalanced expansion takes place from the high pressure cylinder to the receiver. It is thus evident that if pressures and expansions become larger than at present, we shall have to again

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compound our compound engines. This limit can only be ascertained by direct experiments, and all are looking forward with great interest to the results to be obtained by s.s. *Aberdeen* in her forthcoming voyage as an experimental fact towards settling this point. Mr. Parker believes that the limit of beneficial expansion with the two-cylinder compound engine is about reached at a pressure of between 80 and 100 lbs. per square inch. Within the last few weeks a steamer has been completed to work at a pressure of 150 lbs. per square inch with triple expansive engines.

The two papers on the compound engine were discussed together. Mr. Denny, in opening, remarked that he had built a steam-tender with a boiler which would carry 120 lbs. steam. She had now an ordinary compound engine, and he should work her for some time at 90 lbs. and find how much fuel she used. Then he would fit a third cylinder, and work her with three cylinders and 120 lbs., ascertain the consumption of fuel over some months, and lay the results before the Institution.

Mr. Longridge did not think three cylinders were necessary. In the old marine engine there was practically no expansion. The economy of the compound engine was simply due to the fact that it worked expansively. For 60 lbs. steam the right expansion was about seven-fold and in a single cylinder, with two cylinders and 80 lb. they might have an eight-fold expansion, with three cylinders, a fifteen-fold expansion and 120 lbs.; but the consumption of steam per horse power would be practically the same in all three types of engine, namely, about 17 lbs. per hour. There was, however, a small saving to be had out of the higher pressures.

Mr. McFarlane Gray said the theoretical gain by raising the pressure from 60 lb. to 120 lb. was 14 per cent., but as the pressure fell in Mr. Kirk's first cylinder while the valve was open, the gain was only 12½ per cent. The question was—was it worth while to use 120lb. and three cylinders to gain 12½ per cent. There was this good about Mr. Kirk's scheme—that the first cylinder might be taken off when the boilers were worn and the pressure had to be reduced, and the engine would

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go on with the two others, and in this way boilers might be made to last thirty years.

On the Revision of the Tonnage Laws, by Mr. W. H. White, of the Admiralty.

Mr. White began by proposing for consideration the question :—Having regard to the present conditions of trade and shipping, should *internal capacity* be retained as the basis for tonnage measurements ? The majority of the Commissioners on Tonnage, of last year, have answered this question in the affirmative.

Mr. White then describes some early tonnage rules to show that the intention of all of them was to approximately measure dead-weight. The law of 1833, however, introduced the principle of internal cubic capacity, and the law of 1854 proceeded upon the same lines. In framing the latter, two conditions were accepted, first, that the taxable tonnage of a ship should be represented by her freight-earning power; second, that the *space* available for remunerative service—the conveyance of passengers or cargo—should be taken as the measure of freight-earning power. Have the changes in the construction and propulsion of ships made since 1854 necessitated any modification of the opinion that internal capacity is the fairest measure of the possible earnings of most ships ? The view taken in 1854 still holds good in the case of passenger steamers and vessels engaged in carrying light goods, but it appears to be generally admitted that in most ships the limit of freight-earning is to be found in their dead-weight capability. Among other causes tending to this result is the introduction of special appliances for packing many descriptions of light goods into small compass, while the substitution of iron for wood as the material for shipbuilding has tended to an increase in the ratio of internal capacity to dead-weight capability. In awning-decked ships the whole internal space cannot be utilised even when light cargoes are carried. There is, therefore, good reason to object to the universal application of measurement by internal capacity, because the majority of sea-going ships no longer find their limit of earning power in *space*, although in certain classes of ships *space* is still of the greatest value.

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Reasons have also been found against the present system of tonnage measurement in its supposed tendency to foster the construction of specially unsafe types of ships. There is for instance the "well-deck" type of ship, for and against which much has been said. It has been encouraged by other circumstances besides the tonnage laws, but with proper freeboard there is no *a priori* reason why this type should not be safe at sea. While these considerations emphasize the close relation existing between tonnage legislation and load-line rules, they also on the other hand lead to the conclusion that it is unfair to credit the existing tonnage law with losses resulting from deep or improper lading. Mr. White at this point remarks that he has not been able to discover that in its general effect upon merchant ship construction the Act of 1854 has been prejudicial or injurious; and on this ground its abolition cannot be reasonably urged.

He then quotes the reasons urged by the Royal Commission against change in the main principle of the present tonnage. The argument against change, because of the difficulty of making *any* change, he does not attach much importance to, but thinks much more of that derived from the fact that English Register Tonnage is substantially an international tonnage, and is as well the basis of the tonnage rules for the Danube and Suez Canal navigations. Already considerable advantage and convenience result from the approach that has been made to international tonnage, and to change the basis of measurement, except it were done by an International Conference, would practically undo the work of twenty years. He finds a further argument against a change of system in the apparent absence of any general desire for that change on the part of either those who pay or those who receive dues. After carefully reading through the evidence taken by the Commission he can find no trace of any general or widespread desire for such change.

He next considers the alterations in practical detail recommended by the Tonnage Commission, most of which would prove advantageous if adopted. The proposal to include part of the space included in the double-bottom in ships constructed on the cellular principle, he characterises as a departure from the

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fundamental principle of the Act of 1854. There is also the question of covered or closed-in spaces. No form of words in any new clause can prevent the possibility of future controversy, since the ingenuity of builders and owners, and the changing requirements of trade must and will raise problems in the future that cannot be now foreseen. The question of light erections might be dealt with by a further extension of the Act relating to deck-cargoes; if cargo or passengers were actually carried in them, let them be reckoned in the taxable tonnage, if not, let them be exempted. Another possible mode of dealing with the difficulty is, that should an authoritative load-line be compulsorily fixed for all ships, as seems not unlikely to happen, then whatever factor of reduction may be employed in assessing the spare buoyancy of light erections, might also be employed in connection with the estimate of the contribution of these erections to the tonnage. Mr. White considers at some length the proposed alterations in allowances for machinery, and comes to the conclusion that, although it is a good thing to abolish the present system of allowances, the proposed rule rests on no more scientific bases than the old one, and he can see no reason for the recommendation of a maximum limit of 33 per cent., seeing that the Suez Canal limit is 50 per cent.

He next goes on to review some alternative proposals, premising that while the present system can only be defended upon the grounds of expediency and convenience, these grounds are sufficient to make it necessary for the advocates of new methods of measurement to show that their proposals are less likely to cause difficulties or anomalies than the present system.

The dead-weight basis of measurement is advocated by Mr. Waymouth, and no one can fail to remark that its adoption would tend to remove most of the difficulties of the present law, since disputes would no longer arise as to deductions for propelling-space or water-ballast, or light erections above the upper-deck. On the other hand, there is the serious difficulty that passenger steamers and some other vessels are not worked on a dead-weight basis. Mr. Waymouth proposes to meet this by fixing their load-lines on the supposition that they carried dead-weight cargo

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only. The practical difficulty of doing this at all satisfactorily would however be very great, if not insuperable. A less serious difficulty is caused by the fact that Mr. Waymouth's system would alter considerably the aggregate nominal tonnage of the Mercantile Marine and would thus interfere with the statistical uses of tonnage measurements.

The "displacement tonnage" advocated by Mr. Rothery is next noticed. It is proposed as being a measure of space occupied by the ship in a dock, &c., but for all practical purposes the space occupied is not measured by the displacement but by the product of the length, breadth, and draught of water of the ship. The adoption of that product as the basis of tonnage Mr. White goes on to say is a proposal deserving notice. It has been alleged in opposition to it that it would re-introduce the evils of the old Board of Marine rule, and lead to the building of "box-shaped" vessels. Mr. White on this point dissents from the ordinary view that the Board of Marine rule was abandoned because of its evil effects upon the forms of ships, and thinks that a rule depending upon the product of three dimensions, or as he calls it, a "parallelopipedon rule" would not now injuriously affect the forms of ships, especially if a load-line were fixed at the same time by a properly constituted central authority. He concludes by remarking that a satisfactory revision of the tonnage laws cannot be looked for from any Commission or Committee, but rather, as on the last occasion of such revision, as a result of the careful, extensive and laborious enquiry of the competent staff of naval architects which it is to be hoped will be attached to the long-talked-of Shipping Council.

In the discussion which followed the paper, Sir Edward Reed said that the Commission was necessary, because the law needed protection, and Mr. Waymouth's propositions were to some extent absurd, as such vessels as the Holyhead steamers, with little immersion, and on the other hand, deep screw-vessels, could not be rated by them, and passenger ships could not be loaded so as to pay a proper freight due.

Mr. Scott spoke of the origin of the discussion, and referred it to the action of the dock boards, one of which had its receipts of

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£1,400 reduced to nothing, owing to a new interpretation of a clause in the Tonnage Act.

Mr. John could not see what advantage Mr. Rothery could get by giving up space element for weight element, but encouragement should be given to the out-of-the-water part of the ship.

TONNAGE MEASUREMENT, MOULDED DEPTH, AND THE OFFICIAL REGISTER IN RELATION TO THE FREEBOARD OF IRON VESSELS, BY MR. W. W. RUNDELL, OF THE LIVERPOOL UNDERWRITERS' REGISTRY.

The under-deck tonnage is an element which has been introduced more or less directly into all schemes for indicating on a ship's side percentages of spare buoyancy. It is of value for this purpose only as far as it approximates to, or bears some fixed proportion to, the total displacement. Although in some vessels deeper floors or thicker ceiling than usual may have somewhat affected the proportion, it may be stated generally that until recently such variations from the general rule have not been of any great extent or importance. The introduction of double-bottoms on the longitudinal construction in steamers, has, however, altered the case, and in these vessels the difference between the internal and external measurements is so great, that neither under-deck tonnage nor registered depth of hold, are any longer satisfactory guides to their carrying power and freeboard, a continuous double-bottom of twice the depth of ordinary floors being not at all unusual. These vessels are becoming very common, during last year they amounted to one-eighth of the total built. The Royal Commission on Tonnage proposed to deal with these cases by fixing a standard depth of floor plates to which measurements should be taken. Mr. Rundell proposes to attain the same end by quite other means. He has compiled a table of the ratios between the internal measurement and total displacement to upper-deck, for various types of vessel from 300 to 1,700 tons. He proposes that in future the total displacement of the ship shall be found in cubic feet, multiplied by the fraction given for the classes of vessel in the table, and divided by 100, this method being one which will agree with the past in its results,

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and not be liable to change in the future, by changes in the mode of construction of iron vessels. He proposes that spaces above deck should be assessed at the same rate for tonnage as they would be for spare buoyancy, in connection with a rule of freeboard. In connection with this system, depth of hold would no longer be measured, but moulded depth would take its place on the register.

Mr. Rundell further remarks that, in vessels of medium form, 30 per cent. of total displacement corresponds exactly to 25 per cent. of moulded depth. From the 30 per cent. point any required percentage could be easily approximately obtained.

Mr. Rundell next was about to deal with Mr. Martell's new tables of freeboard, but those tables had been only tentatively issued by Lloyd's and are still under consideration. The reading of the paper from this point was therefore stopped by show of hands. We are able to extract some remarks from the suppressed portion of the paper which do not specially relate to Lloyd's tables, but bear upon the general question of freeboard tables, and are, we think, of considerable value at the present juncture. Mr. Rundell ably and pertinently directs attention to the extreme difficulty of determining what are suitable percentages of buoyancy for various kinds of vessels. Many things ought to be taken into consideration: the experience of shipmasters and of owners who have had the fewest casualties during a long period, the lengths, proportions and models of their vessels, the trades in which they were engaged, the causes of deck damage, the length and character of the waves inflicting the damage compared with the length of the damaged vessel, &c., &c. These and a host of other details would have to be gone into, and the results would have to be harmonised and arranged before the suitable percentage of spare buoyancy for any given class of vessels could be stated with confidence. After stating his own inclination to the view that to correctly fix a load-line, it is necessary to prepare for each vessel an accurate scale of her displacement, Mr. Rundell concludes his paper by proposing that in future the official register of each ship should have marked upon it a scale of displacement, and that the depth recorded on it, should be the moulded depth of the vessel.

(*To be continued.*)

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CHANNEL NAVIGATION.

MUCH has been said and written about "Ocean Lanes," for ensuring the greater safety of steamers on the Atlantic; and certainly, if such dangers do exist on that broad Atlantic, and doubtless they do, then how much more impending are they in our narrow channels where dangers to navigation are manifold and threatening; apart altogether from their generally crowded condition?

First, we have narrow seas, with a fair quantity of rocks and shoals interspersed, scoured by conflicting currents, and at times lashed into dangerous violence by fierce gales. Then the seaman's enemy, fog, is a frequent visitor at nearly all seasons of the year; and rocky and dangerous headlands jut out from the coast lines, while harbours of refuge are few and far between.

What we want is greater security in navigation under such unfavourable conditions.

One, out of the legions of losses and casualties that have happened during the last few years in the channel, was a ship homeward bound from California with a full cargo of wheat; and which totally disappeared, with all hands, near Queenstown.

It was supposed that she was run into by a large steamer bound towards Queenstown, and which steamer was doubtless, *very close to a straight line* running from five miles off Tuskar to the entrance to Queenstown. Though steamers have to respect the course of sailing ships, and do so, yet, in the event of collision, the latter invariably get the worst of it, and therefore it behoves all masters of sailing vessels on approaching a steamer to act with double caution, and to endeavour if possible to keep clear of the towering iron stem; it is probably known to all seamen exactly what course nearly all steamers take, or should take, in our channels.

Leaving Liverpool the courses to Holyhead are well known, when they diverge into two great branches; one by way of Tuskar to Queenstown, and the other *viâ* Smalls to Wolf Rock.

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Passing *up* Channel they are about the same, and assuredly such courses are lines of great danger to a crossing ship, when the weather is not clear. They are also lines *within* which she can hardly come to any harm by way of stranding, and beyond which, in the lower part of the Channel, it may roughly be said she has no business, except in daylight or during clear weather.

In the English Channel, except in the case of steamers from French ports, the courses are from Beachy Head to Start, passing headlands from five to ten miles away. At the Start these courses diverge ; one going on to Scilly, and the other stretching southward towards Ushant. Such lanes or courses, like those aforesaid, should be avoided by sailing ships during dark or thick weather, if consistent of course, with other considerations of safety. The risk of homeward and outward steamers colliding, is not so great as it is for *crossing* vessels ; but even that risk might be minimised by some such regulation as that outward bound vessels should keep *about* five miles off the land, and homeward bounders eight miles, or *vice versâ*.

Respecting side and masthead lights, there is much to be said, and much improvement still to be made. In many of the large mail steamers which have special lamp trimmers, they are probably as perfect as one could desire to have them ; but in the vast number of smaller steamers and sailing ships, they are very indifferent. Twenty-five years' experience has convinced the writer of these lines, that such vessels' side-lights are little better than a delusion ; and are invariably not seen when the weather is the least bit hazy, till the ships are actually within dangerous distance.

In clear weather, in many cases, probably more than one-half, the dark shadow of the ship and her sails is seen before the light.

The reasons for this are not far to seek. First, the lamps are not large enough ; and secondly, they require more attention : there is also sometimes a want of vigilance, not only of the look-out forward, but of the officer aft, who, by the way, is probably used up by want of rest ; who has perhaps come on deck at 4 in the

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morning, after three hours' sleep, in a cold, damp cabin, and who had also been facing a stiff sou'-wester in the early part of the night, from 8 to 12.30 p.m. In mail steamers, a petty officer examines the lamps half hourly, although the lamps invariably burn brightly right through the night. These lamps are the best of their kind, and can be seen during a clear night, and when sufficiently elevated, at a distance of 15 miles.

The lamps in sailing vessels, with a few exceptions, are of a very different character in their results. It is certainly an indisputable fact, that after so much has been said and done in this direction, vessels are invariably within dangerous distance before the colours, and, in many cases the lights, are made out. This will probably account for the apparently contradictory evidence which so often surprises the judges of our Admiralty Courts—one side swearing to the lights being exhibited, and the other the contrary.

Articles 15 and 16 of Steering and Sailing Rules are invariably violated unintentionally.

A vigilant look-out discovers a light of some kind, or a dark object, somewhere before the beam, and when the night is not perfectly clear, it is very reasonable to suppose that such object is not more than a mile away, in many cases not half-a-mile. Suppose this look-out to be on the bridge of a steamer going ten or twelve knots, and the vessel whose light is sighted, a sailing ship, approaching at a speed of eight or nine. Under such circumstances these ships are, without doubt, in "such position as to involve risk of collision," and certainly should either slow or stop, &c., &c.; but the invariable custom is to *wait for the colour of the light to be seen*, and therein lies the source of more than one-half the disastrous collisions which occur.

It will be found in investigating the evidence of many witnesses, that they invariably keep on till seeing the light, trusting to the helm to put everything right at the last moment, and, if going clear, certainly passing each other at speed too high and at distances far too close to be pleasant.

So much importance is now attached to speed in steamers, particularly mail boats, that an officer who has courage enough to

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"ring the telegraph," and slow or stop his ship, runs a chance of being regarded by the captain as a nervous or original party who is "always alarming all hands" and bringing them on deck in a fright.

Anyhow, as the custom is to keep on and trust to the "steam steering-gear," no officer who does not wish to be considered conspicuously troublesome cares about doing that which his first thoughts might tell him was proper. Nobody would recommend tacking on *all* occasions in the case of sailing ships, but what should be attended to in navigating the channels during night, &c., is to have the ship, in respect to the canvas carried, thoroughly under command. That this very necessary condition is not attended to so thoroughly as it should be is quite certain. The custom is, independently altogether of the state of the weather, to carry courses and stay-sails, and in some cases, studding-sails, and this during a breeze so fresh, that the officer in charge feels it nearly useless to attempt anything but to trust to his helm; for to bring his ship to the wind would probably dismast her, and to attempt to take in sail is altogether too late, for the advancing ship, shooting suddenly out of the gloom, is now upon him, and he has her to watch.

Carrying too much sail has been, and will be, a very fruitful source of collision, and no ship should navigate our channels under such conditions as have been mentioned, carrying either studding-sails, stay-sails, or courses. The advantages gained are infinitesimal, compared with the great risk incurred. It will be found that in a moderate or even fresh leading wind, courses and stay-sails do not increase the speed more than a knot an hour, and in many cases not so much; yet even to gain half a dozen miles during the *short time* they are in the channel, people *will* run such tremendous risks. There was a time when no ship passed through the channel except under easy sail during thick weather, or at night, but everybody is now in such a confusing hurry, that common and old time precautions are ignored.

The Steering and Sailing Rules are framed on the supposition that approaching ships each understand exactly what the other is doing; whereas, *that* is the great difficulty. It frequently happens

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that during a somewhat hazy night a *vigilant* look-out discovers a small speck of light, and soon afterwards, the dark loom of a ship under sail, probably about a short mile away. *Now* is the time to act, and quickly; but unfortunately the light is so small and so dim, that its colour cannot be distinguished, hence valuable time is lost.

If the size of ship's lamps cannot be enlarged, and if more attention to them cannot be compelled, probably some signal, say a single report, and one, two, or three sharp flashes, ready to the officer's hand, and let off instantly, would improve matters. "Sailing ships under way shall use a fog-horn," yet, all sailors know that the ordinary fog-horn is a "very rotten stick to lean upon," in the case of two powerful ships rushing in opposite directions under a heavy press of canvas, and at a speed of ten knots an hour. The sound of the wind in a fresh breeze is very deadening to all other sounds at sea.

The two great safeguards at night-time, or in thick, dirty weather, are first, *low speed*, and secondly, *wide berth*, and the ship as perfectly under command with respect to her sails, as a steamer's engines are under the "telegraph."

It is a question whether the Steering and Sailing Rules, as at present understood, do not in many cases lead into mischief. Officers suppose that they may approach till close enough to distinguish the colours of lights which never were bright; so close indeed, that when they *are* made out, it is too late to act effectively. It is thus found in practice, though in theory the rules appear admirable.

Anybody who has ever been in charge of the deck during thick weather, or dark nights, must know what a very different complexion is put upon such rules when they have to be carried out in the case of heavy ships going at high speeds; or even at easy speeds, when, owing to *many* reasons, colours cannot be distinguished. It is not very long since that a serious collision all but happened near Holyhead, between two large mail and passenger steamers. One was crossing the channel in the direction of Dublin, and the other bound to Liverpool—a vessel displacing about 7,000 tons, as sharp as a knife, and going a good 14 knots an

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hour. The crossing ship was carrying her lights all right, they were burning very brightly, but the port-light was hidden behind her own dense black smoke.

Thus the Liverpool ship, seeing only her masthead light showing unusually large and bright, took it at first to be some new light on shore, and subsequently, after some little further consideration, probably a tug-boat at anchor, or laying-to.

It was not till suddenly *smelling* the smoke, and actually seeing the whole panorama of her deck, lighted cabins, &c., that she became aware of her dangerous position, and by a courageous use of the port-helm—nothing else would have saved the crossing ship—just grazed by the latter's stern.

But for the steam steering-gear of the Liverpool ship, a collision would have been inevitable, notwithstanding the ready way in which the order was given—and it would have been a most disastrous affair—the former vessel would have been cut as clean into two halves as any sharp iron wedge of 7,000 tons weight could have done it.

This incident, coupled with many accidents which have happened lately during both night and day, may perhaps show that some signal—night and day—is necessary in addition to having the very best lights in their respective places.

It must frequently happen that steamers' lights are hidden by their own smoke; and it *does* frequently happen, that vessels make each other out for some considerable time before they find out how they are respectively steering; and the desideratum appears to be some more ready method of securing such information.

As to stopping and reversing when danger threatens, or when a collision appears inevitable, it is very doubtful if such an evolution could be carried out in *time*, especially in the case of enormous heavy ships going at high speed, during a dark or dirty night.

The steam-whistle in many steamships is little better than an apology for one. It is very doubtful if the best can be heard under the usual conditions, at a greater distance than three-quarters of a mile. Indeed it is difficult to see why the steam syren, or trumpet, should not be used in all steamers great or small. The cost would be but trifling, and no more steam

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required in one case than the other. The fog-horns of sailing ships would probably be found to answer well if their speed were limited to two or three knots an hour, when using it, but beyond that it is quite unequal to the purpose. In conclusion, although the Rule of the Road appears to have made provision against every feature of danger, it cannot be gainsaid that in some cases such provision is much more apparent than real. Those Rules have been in operation now for many years, and no doubt many a collision has been prevented by them, but probably no man is bold enough to stand up and declare them incapable of improvement.

E. B.

THE DEFENCE OF THE COLONIES.—II.

(*Continued from page* 282.)

ANOTHER important outpost is the Isle of France, the scene of so much useless gallantry and so much devotion on the part of English seamen. A squadron of light ships under the command of the heroic Willoughby sailed boldly in and essayed to silence the forts, but their artillery made no impression on bastions of stone and the whole were captured or destroyed. A modern ironclad would make short work of these forts as they now are. It is to be hoped that the remarkable man who has assumed the command of the military forces on the island will look closely into the defences. It is impossible to turn every settlement into an impregnable fortress, yet energy and genius may do much towards preventing an insignificant enemy from levying a contribution, or destroying the shipping in port.

The Cape of Good Hope with its dependencies, like Ceylon, surrendered to the arms of England on the first summons. The volunteer force is now sufficiently powerful to deter the boldest enemy from attempting a landing. The docks and town are, however, exposed to an attack from sea. Expensive, if not disastrous wars have hitherto prevented the colonists from attending to the defences of their seaboard. Fortunately modern

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experience has demonstrated that guns behind earthworks are better protected and more formidable than guns behind batteries constructed of granite. This fact simplifies the science of fortification, clay and granite require very different treatment, and reduces the cost to a minimum. A few long ranged guns thus placed would effectually guard the approaches of Table Bay against any probable contingency which might arise in a future naval war. Torpedo boats would add greatly to the security of this remote spot, always supposing their crews were composed of trained men; for these formidable weapons of modern warfare in the hands of amateurs, are more dangerous to friends than to foes. They appear to bid fair to neutralise in a very great measure the value of the most powerful ironclad. On the other hand, their importance as a factor for the defence of harbours, unless the approaches are contracted, appears not to have borne out the opinions formed. The Danube was sown broadcast with them yet in no instance do they appear to have inflicted injury on the belligerents.

The remarkable islands of St. Helena and Ascension may be dismissed with a few words. Neither possesses a harbour which can shelter a single merchant ship from the attack of an enemy. The former has a chain of old-fashioned fortifications, armed with old-fashioned guns which no ordinary man, however, would attempt to storm. The weak point is due to the fact that the town, according to the custom of uncivilised warfare, might be securely shelled from the offing. It is not probable that the island will again make a noise in the political world. There are no more great Napoleons to send into undignified exile. As a place for refreshing a worn crew and obtaining fresh supplies it is still of value to this country, although its inhabitants are or were obligingly cosmopolitan.

The defence of the Australian colonies is being carried out with vigour. It is most fortunate that the colonists were not induced to sink a large sum for the construction of an ironclad which, in all probability, would have been obsolete before she reached her destination. An ironclad can only be required to encounter vessels of a similar type, and it is not unreasonable to assume that the hostile visit of one to the Antipodes is more than problematical.

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A few heavy guns, torpedo boats, and light cruizers of a design not yet in the building yards, would give a good account of any privateersman who ventured into those remote seas.

In speculating on the future of these colonies it is satisfactory to note that the manly sports which are characteristic of the Saxon from whom they have descended, are passionately cultivated. Cricket, regattas, horseracing, and gymnastics are shared in by every class. In all ages conquering races have indulged in these or similar amusements, which certainly train the mind as well as the body, and beget a confidence and prowess which the effete never feels. So far as can be seen from the present outlook, the soil of these colonies is secure from insult, but their trade might be harried along the coast and off the great harbours by an insignificant squadron of light ships. With this contingency before them, it is time to commence the formation of an infant navy to deter the boldest from attempting a surprise.

Halifax is, par excellence, the beau ideal of a great military and commercial port. Its approaches are well marked by the lighthouses on Sambro and Chebucto Head, its channels deep and safe, and the largest ships can moor alongside the quays. Owing to the absence of rivers the depth of water undergoes no alterations, so that hitherto a dredger has not been required. Unlike the generality of harbours on this coast it is rarely frozen over, no mean advantage when a large portion of the carrying trade is done by sailing ships. Large sums of money have been expended in fortifying the approaches, but the engineers were astonished in 1867 to find that during a dense fog an ironclad had steamed in unobserved by their sentries, and was alongside the dockyard before anyone was aware she was in sight. From this position not only the town and dockyard were liable to be destroyed, but it is doubtful if a single gun could be brought to bear on an enemy who had the hardihood to repeat the feat. It was a lesson easily acquired, yet does it indicate that nothing is impossible to nerve and seamanship.

It is to be presumed that the skill and vigilance of the Engineer Corps have amply strengthened the weak point of the remarkable harbour of Halifax. The heavy batteries

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of the York redoubt, the Citadel, George's and McNabs Islands, and the guns planted on the Dartmouth shore could sink any fleet which attempted to gain the inner harbour in clear weather. If ever torpedoes can be successfully employed it will be in the channels of this magnificent estuary, so contracted are they throughout a great part of their length. That a seaman can enter during the prevalence of dense fogs has been shown, but probably few will attempt the feat. The slightest deviation in the course might prove fatal, and land a ship in such a position on the rocks as to render her an easy prey when the weather cleared. Fortunately, foreign seamen are not so addicted to enterprises of this nature as the English; they do not so readily grasp the subject, and it may be doubted if this generation will see their officers educated in pilotage to our standard. England's chivalrous allies in the Crimean war certainly failed in this particular, and the Germans on the Atlantic have not navigated their ships with the boldness and success of English seamen. In confirmation of this fact the records of wrecks and collisions may be quoted, when the balance will be found to tell heavily against foreigners in proportion to the amount of tonnage employed.

Humanly speaking the great arsenals of the Dominion of Canada are safe from an attack by a *coup de main*, and no man now living will see any European power presume to molest them so long as the mother country upholds her ancient prestige. Should that fail, the same energy to maintain their liberties would be shown by the Canadians as their parent always evinced amidst struggles of no ordinary kind.

The only danger to the Dominion lies on her long frontier of fifteen hundred miles, where a race endowed with the energy and restlessness of their old Norse ancestors hold a country more fertile, rich and powerful than their neighbours. It is to hoped that the animosities which for many years have been rife between these peoples will disappear and that the possessors of the United States will not seek a quarrel in order to attempt the subjection of their poorer brethren.

The river St. Lawrence washes the base of the cliffs on which the ancient capital stands, and presents no insuperable natural

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difficulties to the ascent of a flotilla as far as Montreal. But no city in the world has a more commanding site than Quebec, and the formidable batteries recently erected at Point Sivie joined with its own fire would speedily annihilate any ordinary ironclad which might attempt to force a passage. Here torpedoes could be moored in the channels near the city, and in many of the narrow passes further down the river.

The navigation of the St. Lawrence requires the greatest attention, and with the buoys removed and beacons destroyed, no stranger could pass without first marking the channel by his surveyors, not an easy task with a network of torpedoes in his path.

The Militia of Canada are unsurpassed in the world for their steadiness under arms, and there would be little fear of the most daring commander attempting to land with the small force of seamen and marines at his command. One hundred and twenty-three years since one of those great generals, who are so rare that they almost mark an age, was long baffled in the attempt to take Quebec, although backed with a powerful army. He only succeeded in effecting it by landing at Wolfe's Cove during the darkness of the night, and had he been discovered in the act Canada might have been French still. At that remote period the means of defence were scanty in comparison to what they now are, and it is scarcely possible that a force equalling that of Wolfe's will ever be despatched from the old world on such an enterprise. If it were, or even if superior, its chances of success would be hopeless against the Colonial Militia, which could be brought into line to meet an invader on the field.

From a careful consideration of the above remarks, it is evident that the only real danger to the territory of the Dominion lies from an attack of the United States. Should such an unfortunate contingency as a war between England and America arise, the latter would scarcely attempt the subjugation of a country whose conquest would neither add to their power nor weaken that of their enemy. There is, so far as can be seen, no possibility of such a deplorable event arising during the present generation. On the contrary, every sign whether it be political or

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commercial, points to a different end. As each feels how greatly he is dependent on the other, feelings of animosity and jealousy subside, and in their place a joint appreciation of the necessity of peace for the interests of both is steadily gaining ground. In no part of the world is an Englishman more honoured than in the United States. He may travel from Maine to Mexico, everywhere meeting with a courtesy which is not extended to the traveller of any other nation. At times those little differences which malignant men love to magnify will arise, but as years roll on it is evident to the most superficial observer that they are steadily decreasing in importance. The *Oregon*, the *San Juan*, and the *Alabama* claims might at any moment have brought about a collision, but they are happily settled and the heart-burnings they occasioned a subject of history only.

It is almost unnecessary to touch on the defences of the islands which form the outposts of the Dominion. Neither Cape Breton nor Newfoundland, surrounded as they are by icebergs or field ice for many months of the year, present any great attractions for the cupidity of an enemy. The men must indeed be low in the scale of humanity who would levy contributions on these hardy islanders, who, by dint of a continual struggle with the barren soil on which they dwell, and the cold sea which surrounds them, eke out a scanty livelihood, and often it is a fight with famine through the long winter, as many a tale of village suffering can vouch for.

From these inhospitable shores we must strike off for another of England's great outposts, the Bermudas. This remarkable group of islands were, previous to the development of steam and artillery, perfectly impregnable. The few narrow channels which lead in through the reefs could not be attempted by the most daring seaman without the aid of a skilful pilot and a leading wind. Even then the slightest accident or a sudden calm, no uncommon event at the season when an attack would be attempted, might have disconcerted the best planned enterprise. All this is now changed, and a fleet of gunboats, under able management, may steam in through the North Channel, or other gatways, which, in desperate circumstances, sailing vessels have been known to take. America is,

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however, the only country which could attempt such an expedition, and it would be no easy task for their navy if the contemplated batteries which were long since designed for the defence of the important points have been erected. Many of the old works on Ireland's Island were, a few years since, unfit to mount the heavy guns which have recently been deemed necessary for the defence of first-class fortresses. Floating batteries would prove a great service, and if propelled by steam they could, in the event of being driven from their positions in the opening of the reefs, take shelter under the guns of the dockyard. The vessels which are now in ordinary might be altered to carry out this service; they are now practically useless against modern artillery, and are simply hulks rotting at their moorings, useless alike for peace or for war. To allow them to lie in their present condition can only be considered a waste of public money, as the expenses of stores and ship-keepers through a series of years must absorb large sums.

The Bermudians are reported to have peculiar American proclivities. Tom Cringle is made to say that if they could get their three hundred and sixty-five islands underweigh they would tow them into the Chesapeake. Perhaps at the time he wrote the feeling prevailed, but it must have died out before the present generation was born. New York offers a good market for their early productions of potatoes and other vegetables, and there is accordingly a certain feeling of good fellowship towards such customers, but not sufficient to induce them to accept for their governor a carpet bagger from the North, with his train of extortioners.

On this remote station the services of a militia would be peculiarly valuable, as it is impossible for England to permanently maintain a strong force there, if a great war were raging. Its very isolation will protect it from an attack of any European power, and before America commenced a doubtful enterprise she must be flushed with conquest. We may, therefore, rest assured that the safety of this remarkable group need not cause anxiety. Should the day ever dawn when the United States will be able to fit out a flotilla unopposed for the express purpose of attack, England will have lost so much of her martial prestige that an

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outpost may not be worth defending, for it cannot be of any possible service to a country which is unable to maintain her supremacy on the sea. So long as that is unquestioned the coral islets may be considered the key of the West Indies and all the great ports of the Union. It may never be required, yet the statesman and the soldier leave nothing to chance. Hence, the approaches are jealously guarded and, up to a recent date, at least, no correct chart of the group on a large scale, had been issued even to the flagship on the station.

The next possessions of England on the American side of the Atlantic are the West India Islands. At no remote period what were then considered formidable batteries, with extensive barracks in the rear, looked over the Carribean Sea at all the principal towns. But the uselessness of keeping up a large military force to be decimated by yellow fever gradually dawned on the minds of successive ministers, and one by one they were abandoned to the care of a few police, until Jamaica, Trinidad, and Barbadoes alone are able to boast of reasonably strong garrisons. Except for police purposes, the whole of the white troops would long since have been withdrawn, for the batteries, where they exist, are too contemptible to prevent an ironclad or a modern wooden frigate from capturing any port from Bridgetown to Port Royal. Thus, to leave men there in the event of war with a great maritime power would simply subject them to risk of capture or destruction.

In the Revolutionary War, our gallant allies in the Crimea were the antagonists who endeavoured to obtain possession of these islands. Their colonial empire is limited, but they have continued adding to the fortifications of Martinique and Guadeloupe, until they are really formidable. If any unforeseen circumstances should bring about a war between the two countries, the whole of our possessions in that quarter of the globe will be endangered, unless a powerful fleet is on the station. This is not compatible with the present aspect of Europe, and it would be wiser for the planters to trust to the generosity of their conquerors, than to the goodwill of the negroes who have given ample proofs that they are not to be trusted with arms. The native police, may, however, be excepted,

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for they have at every attempt at insurrection sternly shown their allegiance to the whites. This was strikingly evinced in the sanguinary riots of Antigua and Jamaica, where the courage of Governors Hamilton and Eyre saved these islands from being the scene of every species of horrible crime which half-tamed savages are so prone to indulge in when their passions are aroused. The terrible example of St. Domingo proves that it would be better for the interests of humanity to abandon all to a civilized enemy, rather than resort to the doubtful alternative of arming the descendants of a race of slaves.

If it were necessary, no harbour in the world is more susceptible of being fortified than Port Royal, the port of Kingston. The eastern channel could be easily blocked up by a few sunken vessels, and a battery on the point would rake the fairway from end to end. An attacking fleet must have to pass within a few yards of the guns, and there are not many seamen who would willingly attempt such a dangerous manœuvre, unless some great interests were at stake. At Port Henderson, similar facilities are offered for the sites of batteries, but there is not a probability of their being utilised.

On the other hand, the long beach of the Palisades offers for several miles an unbroken line of excellent spots for landing, so that the capital of Jamaica is really liable to be taken by a small military force of an enterprising enemy. This island, like the whole of the group, must therefore depend on the fleet for its security.

Of the few remaining islands of the Antilles which belong to England it is almost superfluous to add that nothing in the form of permanent defences can be attempted. They resemble the small hamlets in the vicinity of great fortresses which are compelled to allow their fate to be decided by that of their more powerful neighbours. No amount of courage or self-denial can alter the course of such events, and any attempt to over-ride them will bring woe on the conquered. The wars of the future are not to be carried out by a series of desultory conflicts which, while they cause much bloodshed, scarcely affect the great questions at issue, but by a few grand moves which only the accomplished general can

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comprehend. For example, the resistance of France after the capture of Sedan and Metz was unmilitary and unavailing. While rivers of blood were shed and towns were in flames not a single advantage was gained, and when total prostration came, as it was sure to do, the conqueror levied a war contribution so great that financiers thought it impossible for the country to pay it without irretrievable ruin. This, however, was not the worst evil which befell them. The loss of Alsace and Lorraine is as deeply engraved on the hearts of Frenchmen as that of the Isle of Wight would be on our own, if a foreign flag floated over the palace at Osborne and the guns of an enemy at Cowes commanded the Solent.

One of the richest of England's possessions on the South American continent is Demerara. Ships, whose draft of water does not exceed twenty feet, cross the bar and anchor off the town in deep water. A strong garrison was formerly maintained here and the fortifications when constructed were, for the time, respectable. They are now useless owing to the great changes which modern improvements have wrought in ships and guns. A few white troops are or were stationed there, but the yellow fever played sad havoc with the youthful Saxon, and the Dead March in Saul was often heard as the sun set over the western plains. In a single sickly season sixteen officers succumbed to the only disease, yellow fever, which scourges this earthly Paradise.

An enemy's squadron might, if judiciously handled, effect much mischief on such isolated places, but as before stated it is better to submit to the possible evils of civilized warfare than those which might occur if an ignorant negro population were entrusted with arms. In all wealthy Colonies a formidable militia ought to be organised amongst the whites. An institution of this nature is always valuable for the awe it inspires in a turbulent and excitable community, and it is scarcely too much to add, that the insurrections of Antigua and Jamaica would have been nipped in the bud by a small force of determined Europeans, who possessed the rudiments of military training and good weapons.

The type and number of ships required to protect this part of the globe during war would depend entirely on the maritime power

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of the country with which we might be at issue. France, Spain and Holland have a foothold in the islands, or on the mainland; that of France has already been briefly described. On the magnificent port of the Havana we need not dwell. It once yielded to the prowess of English seamen and soldiers, but since that epoch, wealth and engineering science have greatly added to its fortifications, which are also defended by the flower of the Spanish army. They may therefore be considered impregnable against an attack from the sea, and by land it is out of the bounds of common prudence, and no country save the United States is likely to make the attempt by land.

The Americans were in treaty with the Danes to purchase the island of St. Thomas, but the devastating hurricanes to which it has been lately subjected, appears to have cooled their ardour for the acquisition.

The sturdy Hollander holds the forts of Curacoa, and as the seaman enters, by the aid of steam, the narrow cleft between them, he marvels over the courage of the men who sailed their frigates to the walls and scaled them from the yard-arms. It was a marvellous feat if history be true. The gallant Gordon, who led in, has not long been in his grave. The deadly rifle and mitrailleuse will often prevent the repetition of similar deeds of daring, still opportunities will arise when they may be equalled, but not surpassed.

The Falkland Islands are not likely to attract the cupidity of an enemy, and may be safely disregarded in any plan of colonial defence, although they might serve as a starting point for a privateer to annoy the homeward bound ships of New Zealand, and the Australian Colonies. From this remote outpost of the empire to Vancouver's Island, there is not a foot of English ground, although a vast amount of English commerce is scattered along the seaboard of the vast Pacific.

Vancouver's Island which the ghost of the great navigator must haunt if it beholds what we ceded to the United States for a boundary line, is the head-quarters of the Pacific squadron, and its port one of the best on the coast. Should a war unhappily occur between this country and the United States, the English

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fleet will be sorely pressed to defend so remote, yet so useful an outpost against the great republic. The wisdom of English statesmen will ever be employed to guard against such a calamitous event, but as circumstances may arise which will force them into war, the danger must be looked steadily in the face. Come what may, England will not sacrifice her sense of right and wrong at the bidding of any people, but trusting to the goodness of her cause, will fearlessly assert her rights against all intruders on her domain. As Lord Granville recently pointed out, England has rights as well as the United States on the American continent, and is ready, if driven to extremity, to defend them with the whole force of the Empire.

If we may be permitted to form an opinion from the great political events which, during the last decade, have altered the map of Europe, it does not appear that there is any disposition on the part of the belligerents to annoy colonial interests. Probably this reticence may in a very great measure be due to the fact that modern wars have been brief and severe to an extent demanding the concentrated forces and energies of the principals. The last soldier and the last gun have consequently been retained at home and fought to the bitter end. It would seem from this that the mother country would act unwisely in attempting to fortify any great number of the outposts of the Empire. Such a course of action would not only be calculated to withdraw our regular troops and armaments from home defences, but also tend to embarrass the war minister at a time when the salvation of the Empire might depend upon the rapid concentration of all arms. As was stated in "Home Defences," so long as the power of England is intact, the colonies have not much to fear from hostile fleets. This simple truth will doubtless strengthen their loyalty to the mother country in an age when chivalry of feeling is looked on as moonshine. A gentleman not long since on presenting a drinking fountain to his native town could not forbear sneering at Lord Beaconsfield's policy by stating that he preferred the conquest of gas and water to conquests in India and Africa. He omitted, however, to state that gas and water require courage and statesmanship to defend them. The man who loves war for war's sake must be

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constituted on the lowest scale of humanity, and is a rarer animal than many are inclined to believe. But unfortunately there are occasions when nations like individuals must stand up for their rights at all risks. Any other course is not only contemptible weakness, but in the end leads to sure and certain disaster. Subsequent to the publication of the first part of this series of articles, an admiral of the German Navy has favoured the world with his views on England's possession of Heligoland, and another writer in summing up the strength of maritime fortresses pronounces Williamshaven to be one of three which are impregnable. It is but a repetition to state that these gentlemen only second what has appeared on the subject in the pages of the *Nautical Magazine*.

It is satisfactory at least to know that the former will, at its present rate of decrease by the erosion of the waters of the North Sea be finally engulphed about A.D. 2500. Consequent on this it is unreasonable to be anxious about the views our gallant opposite numbers entertain on the subject of this dependency. The last-named fortress comes under a very different category, and by its situation bids defiance to the navies of England or the world.

From its grim portals the whole of the carrying trade of the East coast of Great Britain, from Cape Wrath to the Thames, may be threatened; while, as we have before said, not an accessible harbour of refuge or a serviceable battery exists on that long line of seaboard. In itself it is sufficient to awake the dormant feeling for plunder in the breasts of the old Norsemen and Saxon. It recalls the words of that old German warrior as he walked through London, "What a city to plunder." Yes, and along our defenceless coast are many small Londons, raised by the toil and genius of Englishmen, where wealth, and comfort, and ease exist, to which no parallel can be found in the history of the world, and it is a subject for grave reflection to feel that no great national Station Bill is formulated by which these centres of everything that is worth living for may be protected.

We have recently heard a great deal of the silver streak. It is not an unmixed advantage to a country which must import its food by sea or starve. To carry out the former, the energy, the

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courage, and the seamanship of those who dwell within, must enable their fleets to ride triumphant on every sea, and thus allow the colonies, for whose benefit this article has been penned, to securely land their produce on English soil. It is a grand question to work out; given, a population of 36,000,000; how to feed them.

W.

FROM THE ENGLISH CHANNEL TO THE WEST COAST OF NORTH AMERICA VIA CAPE OF GOOD HOPE.

THE route from the Lizard to the West Coast of North America (San Diego, San Francisco, or Columbia River) must be, according to where the Pacific Equator is crossed, from 5,000 to 8,000 miles shorter *viâ* Cape Horn than *viâ* the Cape of Good Hope; hence the Cape Horn route is the one of which most is known, and which was very ably discussed by Maury. Of the longer route to the same ports *viâ* Cape of Good Hope little is known except of that part of it leading to Australia and New Zealand, and this has never yet been discussed in connection with the routes across the Pacific from the Australian Colonies to the Northern ports of Western America. In 1876 the ship *Wasdale*, starting from Liverpool in July, made the voyage *viâ* the Cape of Good Hope to San Francisco in 136 days. We have no information as to the details of this voyage, but are enabled to lay before our readers a very practical solution of the route from the Lizard to San Diego *viâ* Cape of Good Hope, accomplished in 128 days (May to September, 1881) by the ship *MacMillan* (deeply laden) under the command of Captain Gray.

LOG OF THE SHIP "MACMILLAN," CAPT. GRAY (1881).

May	20			Left Antwerp.		Days.		Total	
,,	23			Off Lizard.	...	3		Days.	Dist.
,,	30	...	40° N.	14° W.	...	7	...	7	
June	3	...	30 N.	19 W.	...	4	...	11	
,,	7	...	20 N.	24 W.	...	4	...	15	

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			Days.	Total Days.	Dist.
June 11	10° N.	25° W.	4	19	
„ 16	Equator	26·6 W.	5	24	3,214m.
„ 20	10 S.	28 W.	4	28	
„ 24	20 S.	28·5 W.	4	32	
„ 30	30 S.	25 W.	6	38	
July 6	38·4 S.	Mer. Green.	6	44	3,180m.
„ 10	38·4 S.	18 E.	4	48	
„ 15	38·5 S.	40 E.	5	53	
„ 23	39 S.	80 E.	8	61	
Augt. 7	Through Bass Strait		15	76	6,919m.
„ 15	N. Cape, New Zealand		8	84	1,255m.
„ 17	Sunday Is.		2	86	
„ 26	Penrhyn Is.		9	95	
„ 29	Equator	155 W.	3	98	2,809m.
Sept. 4	10 N.	150 W.	6	104	
„ 8	20 N.	152·2 W.	4	108	
„ 16	30 N.	148·1 W.	8	116	1,925m.
„ 28	At San Diego		12	128	1,601m.
				Total distance =	20,908m.

From Meridian of Greenwich to Three Kings (New Zealand) 8,174 miles in 40 days, being an average of 204·4 miles per day.

From Three Kings to Equator in 155° W., 2,809 miles in 14 days, being an average of 200·6 miles per day.

From Equator to San Diego, 3,526 miles in 30 days, being an average of 117·5 miles per day.

Average rate per day throughout the voyage 163·3 miles. A long voyage boldly undertaken and well got through.

It is worthy of note that a German ship, the *Jupiter*, left Cuxhaven four days before the *MacMillan* left Antwerp; took her departure from the Lizard the day after the *MacMillan;* then, *viâ* Cape Horn, and crossing the Pacific Equator in 117° W., made San Diego in 131 days; she was 74 days from 50° S. in the Atlantic, 69 days from Cape Horn, and 31 days from the Pacific Equator. The *Jupiter* followed what is known as the most

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approved route, much the shortest in distance, and may be said to have made an average passage.

Did the *MacMillan* take the best route across the Pacific? She certainly did not take the approved route for a sailing ship, and yet made what she wished for, a very quick passage.

So far as regards the Pacific, the only comparable route with the *MacMillan's* is that of the ship *Min-y-Don*, which, in 1876, ran from Sydney Heads to San Francisco in 46 days. The two tracks very closely approximate, as will be seen at a glance; both trend between the Friendly and Cook Islands; thence towards Penrhyn Island, across the Equator, a short distance eastward of the Hawaii Islands, and thence to their respective ports.

LOG OF THE SHIP "MIN-Y-DON," CAPT. LESLIE (1876).

April	28	Cleared Sydney Heads.						Days.	Total
May	5	...	33·7°	S.	175·2°	E.	...	7	Days.
,,	8	...	28·6	S.	167·7	W.	...	3	10
,,	12	...	20·3	S.	163·3	W.	...	4	14
,,	16	...	10·0	S.	157·3	W.	...	4	18
,,	19	...	0·8	S.	157·1	W.	...	3	21
,,	25	...	10·9	N.	152·8	W.	...	6	27
,,	28	...	19·1	N.	154·1	W.	...	3	30
June	1	...	31·4	N.	149·4	W.	...	4	34
,,	8	...	38·0	N.	136·0	W.	...	7	41
,,	12	...	38·3	N.	124·2	W.	...	4	45
,,	13	In San Francisco Harbour					...	1	46

The *Min-y-Don* made 7,641 miles from Sydney to San Francisco in forty-six days, at an average rate per day of 166 miles.

The approved route from Australia or New Zealand to N. W. America is to take the great circle to 40° S. in 135° W.; thence to cross the Equator in 115° to 120° W.; cross 20° N. in 120° W. if possible; and when through the N.E. trades make for your port. In contradistinction to this the tracks of the *Min-y-Don* and *MacMillan* lie through the very heart of the Pacific, and are probably the best passages on record. But they may be said to have been concluded before the end of the summer in the Northern Hemisphere.

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Another log we have of a passage from Newcastle (N.S.W.) to San Francisco in 1872 (May-July) gives a route between the Fiji and Friendly Islands; south of the Samoan group; thence to westward of the Hawaii Islands; and so to port in fifty-two and a-half days.

In 1871 (Sept.-Oct.) a voyage was accomplished between the same two ports in fifty-three days; the track lying between the Friendly and Cook Islands, thence to westward of the Hawaii, and so to the port of destination.

Of other logs in our possession, some of the ships took a route more to westward than any we have indicated, others took the approved route eastward of the Low Archipelago, but they are all failures as compared with the passages of the *Min-y-Don* and *MacMillan*; they range between fifty-five and seventy-six days, giving a mean of sixty-three days. The routes in the direction of Ducie, Elizabeth, and Pitcairn Islands appear to be decided failures; and are, in distance and time, the longest of any we have; one captain, when near Elizabeth Island on his thirty-ninth day out, in November, wishes that he had gone north after leaving North Cape of New Zealand. The route between New Caledonia and the Fijis appears to be too far to westward, with the winds very light and baffling on both sides of the Equator in March and April.

We state the case as it appears to us, without offering any decided advice; sixteen to eighteen logs are not sufficient to determine the relative value of routes across the Pacific. Nevertheless the track of the *Min-y-Don* or *MacMillan* seems a very feasible one during the spring or summer of the northern hemisphere, corroborated as both partially are by the other two logs; but to stretch away from the Equator to westward of the Hawaii Islands is a decided mistake. The *Min-y-Don* and *MacMillan* passed eastward of those islands.

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SCREW STEAMERS IN A GALE.

MOST persons are disinclined to believe in things opposed to life-long teaching, and it is the knowledge of this tendency of our nature which prompts the writer to give the seafaring world the benefit of his own experience in the somewhat novel plan of heaving a steamer to with her *quarter* to the sea.

Whilst in command of the s.s. *British King* during a very stormy passage to Philadelphia in February of this year, the writer was twice induced by circumstances to stop the engines and heave-to after the manner described by Captain Shackford in the March issue of the *Nautical*. On the first occasion the vessel remained with engines stopped and fires banked for 24 hours, and on the second occasion for 26 hours. Both were furious gales with very high topping seas, and the vessel which had previously been plunging madly and deluging the decks with water, now rode them out like a duck with an almost entire absence of labouring and straining, the quantity of ugly water which lopped on board was comparatively little, and the violent rolling was very materially dimished; in fact the change was marvellous.

The gales commenced in both instances at S.S.E., increasing and veering to the westward after the common fashion of the North Atlantic.

Having decided to heave-to in the new way, which the writer understands was first adopted by some of the commanders in the Inman line, all sail was taken in with the exception of the double-reefed fore-trysail, and the helm clapped hard-a-port during a smooth; the yards being already braced up to starboard, did not require touching. As soon as the vessel, by paying off, had brought the wind abaft the port-beam, the engines were stopped, but the helm kept as before. When, after a while, she had so to speak, taken up her own position, it was found that the vessel kept the wind from two to three points abaft the beam exactly as described by Captain Shackford, and also, as in his case, sagged to

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leeward at the rate of two or three knots per hour according to the strength of the squalls.

This then appears to be the natural behaviour of a screw steamer if left to herself with engines stopped; and when circumstances permit, it is certainly a long way preferable to trying to keep her head on with the propeller going.

The causes which operate to make a screw steamer take up such a position, are as follows:—In the first place, owing to the extra sheer at the bow, and the heavier masts and yards, there is more surface exposed to the wind at that end of the ship. Further, in the case of vessels modelled like the *British King*, the forefoot is cut entirely away, which of course diminishes the lateral resistance to the water, or, as sailors term it, the fore-gripe, and so allows the bow to fall off more readily. This shape of bow—originated by Harland and Wolff of Belfast—is now much copied by other builders, though perhaps not to the same extent.

At the stern we have exactly the opposite conditions:—For example, there are lighter spars and less gear, less rise or spring in the build, greater draft of water, and, as a consequence, less surface exposed to the wind. Added to all this we have the square shape of the heel where the stern-post joins on to the keel-bar, the heavy drag of the rudder angled across the stern, and more powerful than all, the resistance offered by the screw-propeller which when stopped, acts as a drogue or sea-anchor.

In olden times when the stern was the part most vulnerable to the attacks of the sea, this method would have been attended with considerable risk, but it is scarcely to be feared now-a-days, nor is it even likely that the rudder would sustain damage, though it must be confessed that this latter is the weak point of the whole affair. But if danger to this important part were apprehended, the vessel might be tried with the helm amidships, which would allow the rudder-chains to be set taut on either side as a preventer. Advantage might also be taken of the wonderful property of oil in depriving the breaking seas of their viciousness; and to such an extent is this property now recognised, that some vessels have special tanks at the stern for the purpose, with a small scupper or outlet for the oil, whereby it is allowed to drop slowly overboard

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and smooth the surface. Although we have shown that a vessel with the build, trim, and conditions indicated above has behaved in a most satisfactory manner at a critical time, it by no means follows that all others will do so, nor that the same vessel will do so on all occasions, as it may happen for example that, owing to the coal bunkers being abaft the centre of the ship, she will lighten up aft and get by the head near the end of the passage. Sometimes also, especially in flush-decked steamers, the preponderance of deck houses at the after end, acting like so many sails, might counteract the effect of the trim and propeller. When, however, in the judgment of the captain, his ship fulfils the required conditions, he need not hesitate to put into practice this method of heaving-to in a gale, which possesses moreover the not-to-be-despised advantage of saving fuel.

One point yet remains to be noticed. In handbooks on the Law of Storms the seaman is told to heave-to on the starboard-tack in the right-hand semicircle, and port-tack in the left-hand semicircle, in both hemispheres, and that by so doing the ship will come up as the wind veers and thus enable him to bow the sea. Bearing this injunction in mind, it follows that as in the new mode of heaving-to you reverse the end of the ship presented to the sea, so also you must reverse the part of the rule which has reference to the tack she is to be placed on. Thus, in the North Atlantic, the more usual thing is for a gale to spring up at S.S.E. or south, and veer gradually with increasing force to the S.W. after which it sometimes continues to veer gradually, and at others chops suddenly into N.W. Under these circumstances, the vessel's *port*-side should be presented to the storm, and as the wind, in veering, changes its direction much more quickly than the sea, there will be no danger of the vessel getting into the trough.

SQUIRE T. S. LECKY.

March 27th, 1882.

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IRON ORE IMPORTS.

AN extensive development has taken place in the carrying trade of iron ore, and that in a very few years. For instance, the quantity of that article (including chrome) imported into the United Kingdom in the following years will prove this assertion :—

1876	672,235	tons.
1879	1,085,445	,,
1880	2,632,601	,,
1881	2,450,698	,,

The largest quantity is that for 1880 and was brought from the countries as under :—

Russia	15,723	tons.
Portugal	35,775	,,
Spain	2,278,962	,,
Italy	176,750	,,
Turkey	10,683	,,
Algeria	82,248	,,
Other Countries	28,460	,,
	2,632,601	,,

The following summary will show the proportion which these figures bear to the quantity raised at home :—

Year 1880.	Tons.
United Kingdom—from mines not in the coal measures...	12,628,932
Argillaceous and Black Band, obtained from coal measures	5,397,477
Burnt Ore from Cupreous Pyrites ...	427,730
Iron Ore imported	2,632,601

Showing the quantity imported to be now about an eighth of that used.

These figures are for the ore itself, and of course, independent of the "iron stone" found in the coal measures. The

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amount of that item raised in 1880 in the United Kingdom was 11,664,726 tons.

It is curious to note the spurt that appears to have been made from 1879 to 1880. This was owing to the great stimulus to the iron trade during the latter year. In 1881 a falling off took place of about 180,000 tons, and the great Welsh ports appear to have suffered most. That was probably owing to the stoppage of the Cyfartha works at Merthyr Tydfil belonging to the Crawshay family. These works, it is said, are to be converted into steel works, hence the slackness at the ports in the Bristol Channel. Middlesbro' has suffered a little—but Newcastle and Glasgow have made great strides onwards, while some smaller ports have disappeared from the list above the 20,000 ton limit.

It may be well to point out the conspicuous place which Bilbao is assuming in the exportation of iron ore. By a Spanish Official Report it appears that in 1879 Bilbao exported—

To England	692,972	tons.
,, Scotland	42,471	,,
,, Other ports	382,393	,,
Total	1,117,836	,,

The development of this traffic is likely to be great as the mines at home get worked out. A large number of steamers are now employed specially in the trade with Spain, and others are being built for the same purpose.

North Atlantic.—Floating Wreck South-westward of Cape Finisterre.—The master of the British steam-vessel *Annan*, reports having, on the 18th March, passed the wreck of a vessel (floating very low, bottom up, covered with weed, and apparently a long time in the water) in lat. 41° 31′ N., long. 16° 28′ W.—about 340 miles south-westward of Cape Finisterre. This wreck presented a danger to shipping. In this locality, the drift current may be considered to set in an E.S.E. direction (*true*) at the rate of about one-third of a mile an hour.

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DAILY WEATHER CHARTS FOR THE NORTH ATLANTIC OCEAN.

[From the announcement in our advertising pages many additional particulars will be found, by which masters and officers may make themselves more fully acquainted with the requirements of the Meteorological Office. The science of meteorology is one which it is the especial interest of mariners to develop by all means in their power, and we sincerely trust that the invitation of the Meteorological Office will meet with a full and serviceable response from our Mercantile Marine generally. The table also inserted will give captains more detailed directions as to the method of furnishing the information required. The return asked for will not involve any serious expenditure of time or trouble on the part of captains, and indeed may be regarded rather as an agreeable relaxation from their more onerous duties.—Ed. *N. M.*]

THE following statement has been issued from the Meteorological Office, London:—

"The Meteorological Council propose to undertake the preparation of daily weather charts of the North Atlantic Ocean for the thirteen months beginning on August 1st in the present year, and ending on August 31st, 1883.

"It is well known that the changes of weather which we experience are in general caused by atmospheric disturbances which travel more or less rapidly, and undergo more or less modification during their progress. By far the larger number of the disturbances which visit the British Islands arrive on our shores from the Atlantic Ocean, and our earliest information as to any impending change is consequently derived from telegraphic reports from the Atlantic coasts, especially from the British

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stations at Stornoway, Mullaghmore, and Valentia, and occasionally from the continental observatories at Rochfort and Corunna. But of the origin and previous history of these systems we have no sufficient knowledge, except in a few isolated cases.

"The Meteorological Council believe that any systematic information which can be obtained as to the origin, development, and laws of motion of the atmospheric disturbances which occur over the Atlantic Ocean would promote the science of meteorology, and be of immediate practical utility. Such information could not fail to be a benefit to seamen traversing the Atlantic Ocean, and would tend directly to the improvement of the forecasts and storm warnings issued to the British coasts, by rendering the interpretation of the first indications of approaching changes observed at the western meteorological stations more easy and certain.

"The importance of a systematic study of the weather of the North Atlantic Ocean has long been recognised, and series of daily synoptic charts, more or less resembling those now in contemplation, have been prepared at various times, not only by the Meteorological Office, but also by the Association Scientifique de France under the guidance of Leverrier, by Captain Hoffmeyer, of the Danish Meteorological Institute, by the Deutsche Seewarte, at Hamburg, and (as a part of a wider plan) by the Chief Signal Office of the United States. But none of these charts, however valuable in other respects, supply adequate materials for a satisfactory discussion of Atlantic weather, chiefly on account of the small number of the observations upon which they are founded as compared with the magnitude of the area over which they are spread.

"Evidence of the interest attaching to the connexion between English and Atlantic weather is afforded by the efforts which have been made during the last few years by the proprietors of the *New York Herald* to transmit to England from America telegraphic predictions of approaching disturbances, which (it is presumed) are founded on the reports of vessels arriving in America from the Atlantic Ocean. Reports such as these from a large number of vessels would be of great value; but the predictions taken by

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themselves cannot be utilised in a scientific investigation of weather.

"The Meteorological Council gratefully acknowledge the large measure of invaluable help which they have hitherto received from seamen and the shipping interest generally. But as the object now proposed can only be achieved by the voluntary co-operation of an increased number of observers, they feel justified in making a special appeal for assistance to the owners, captains, and officers of ships, and especially to the great companies whose steamers ply between this country and America. In a science which, like meteorology, is still in its infancy, every advance is attended with great difficulties, and the Council are well aware that it would be easy to be too sanguine as to the importance of the results to be obtained by the inquiry which they are about to undertake. But having regard to the loss of life and property occasioned by storms on our coasts, they feel confident that their proposal will commend itself to the public generally, and will insure the active co-operation of those classes of the community for whose benefit it is primarily intended.

"It is proposed to ask for observations of the barometer, of open air and sea surface temperatures, wind (direction and force) and weather at 8 a.m. and noon each day, with the position of the ship at noon.

"Forms for recording the observations will be supplied by the Meteorological Office, 116, Victoria Street, London, S.W., on application to the Marine Superintendent."

The following is the appeal issued, with the suggested form to be filled up :—

METEOROLOGICAL OFFICE, LONDON.

The Meteorological Council propose to chart and discuss the weather of the North Atlantic Ocean for the 13 months beginning August 1st, 1882, and ending August 31st, 1883; and they request owners, captains, and officers of steam-vessels and sailing vessels traversing the North Atlantic Ocean to assist in the work, by furnishing observations transcribed on forms of which a specimen is given below, and which will be supplied by the Office. The Council propose to discuss the observations as early as possible.

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The use of the forms will save much time and labour in the Meteorological Office, and it is believed that the transcription from the log will cause but little trouble to the observers.

OBSERVATIONS TO BE TAKEN AT SEA AT 8 A.M. AND AT NOON OF SHIP'S TIME.

Barometer and (if a thermometer is attached to it) the Attached Thermometer.—Give, if possible, a few readings in port before leaving, and in each port which you visit.

Temperature of Air in the shade on Deck (if observations can be made).

Temperature of Sea Surface (if observations can be made).

Compass Deviation (that is, the error due to the iron of the ship) on the course steered.

Wind—Direction (by compass) and Force.—The force may be expressed in words, or by the figures of Beaufort's scale, whichever the observer is in the habit of using.

Weather.—In words or by the letters of Beaufort's notation, whichever the observer is in the habit of using.

Position of Ship.—At noon only.

In the column headed "Remarks" please to enter—(1) Whenever an important change of wind occurs, the time of its occurrence, and the direction and force of the wind before and after the change; (2) Whenever a gale occurs—the lowest reading of the barometer during the gale, the time of the lowest reading, and the direction and force of the wind at that time.

BOOKS RECEIVED.

The British Navy: its Strength, Resources and Administration. Vol. II. By Sir Thomas Brassey, K.C.B., M.P., M.A. London: Longmans, Green and Co. 1882.

IT is but a few months since that we brought to the notice of our readers the first volume of Sir Thomas Brassey's great work on "The British Navy," and now the second volume has been issued from the press, discussing various "miscellaneous subjects connected with shipbuilding for the purposes of war." The

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new volume consists chiefly of a compilation of "Essays and Papers on Naval Subjects," with running commentaries on their most important features, dealing successively with armour and armour experiments, guns and gunnery, torpedoes and torpedo boats, the comparative strength and resources of naval powers, unarmoured ships, and harbour defence and coast service vessels; concluding with a historical sketch of naval expenditure since Trafalgar. Officers of the merchant service will be especially interested in the section which treats on "Mercantile Auxiliaries," showing the importance of having a reserve of such cruisers, and discussing their fighting power. As with the previous volume, so with this, the illustrations are good and numerous; and there are two full-page engravings, one showing the Cunard steamer *Servia*, and the other the Allan Line steamer *City of Rome*. The value of the volume as a book of reference is greatly enhanced by a well arranged table of "Contents," and a very full Index.

(1.) *List of Lighthouses, Lighted Beacons, and Floating Lights on the Atlantic, Gulf, and Pacific Coast of the United States.* Corrected to January 1st, 1882. Washington, U.S.

(2.) *List of Lights on the Northern Lake and River Coasts of the United States; and also of the Canadian Lights on the Northern Shores of those Waters.* Corrected to January, 1882. Washington, U.S.

The U.S. Light Lists continue to maintain their character for accuracy, and for the excellence of the remarks attached to special lights. Our perception may be obtuse, but we cannot see why the U.S. Lighthouse Board should be the only one among maritime nations that gives a copy of its Light Lists "free of charge to any shipmaster on application to the office."

(1.) *Fourteenth Annual Report of the Department of Marine and Fisheries, being for the Fiscal Year, ending 30th June,* 1881. Ottawa.

(2.) *Annual Reports of the Harbour Commissioners of Montreal for the Year* 1881. Montreal. 1882.

(1.) The first Report relates to the Dominion in general; and it is well to know that the Marine Department of our great colony

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is as actively alive to shipping interests as usual—to the establishment of new lights and fog-signals; the maintenance of such as already exist; the examination of masters and mates; the construction and management of wharves, piers, and breakwaters; the inspection of shipping; and the superintendence of observatories and the meteorological service. During the ten years since the Act came into operation, 1,190 masters' certificates and 577 mates' certificates of competency have been granted.

(2.) The second Report is local, and confined to the harbour of Montreal, but that part relating to the dredging operations and deepening of the ship channel between Montreal and Quebec is as interesting as it is important.

(1.) *Chart of the Indian Ocean—Suez to Penang, including Zanzibar and Mauritius.* Compiled by R. C. Carrington, F.R.A.S. Marine Survey of India.

(2.) *Port of Maulmain.* Marine Survey of India.

We have before us the *Catalogue of Charts*, &c., issued at the Marine Survey Department, Calcutta, by order of the Government of India. The number of charts seems to grow apace, and the department, through its surveyors, is active in every part of India where new work has to be done, and old work re-examined.

The chart first on our list is a general one of the Indian Ocean, and is at once a physical and track chart, illustrative of the set of the currents in the two monsoons, the lines of equal temperature of the surface water for February and August, and the curves of equal magnetic variation, with abundant clear space for plotting down a ship's position day by day.

The "Port of Maulmain" is a plan on a very large scale resulting from the survey of Mr. Maurice Bean, of the Indian Marine, while officiating as Port Officer of Maulmain in 1879-80. The hydrographic details are abundant and clear.

Report of the Meteorological Council of the Royal Society, for the Year ending 31st March, 1881. Presented to both Houses of Parliament by command of Her Majesty. London. 1882.

The Report is, as usual, arranged under three headings. I. Ocean Meteorology; II. Weather Telegraphy; and III. Land Meteorology

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of the British Isles. The first of these subjects is that with which our nautical readers is most interested, and they will be glad to know that the "Discussion of the Meteorology of the six ten-degree squares lying near the Cape of Good Hope" which has occupied much attention during the past four years, is now completed, and will be published at an early date. The "Sea Surface Temperature Charts" for the three great oceans and for the four cardinal months of the year, will also probably be completed within the present year. Considerable progress has been made in the preparation of the data relating to Arctic Meteorology; and the Sea Temperature Observations round the coasts of the British Islands having been discussed, the mean values for two years will appear in a Meteorological Atlas of the British Isles. The average of success of the weather forecasts in relation to the whole United Kingdom has been 75 per cent. Notes on various instruments and special phenomena are again an important part of the Report. The total number of Logs received during the year was 159, of which it is well to know that 115 have been classed as "excellent." In conclusion, we call the particular attention of shipmasters to an appeal from the Meteorological Council which appears in another part of this month's *Magazine*, and in which it is proposed to obtain a series of Atlantic weather reports extending over thirteen months, commencing on the 1st of August next, to the end that we may know more of the relation of the Meteorology of the Atlantic to that of the British Isles.

CORRESPONDENCE.

INTENDED LIGHT ON SAPIENZA ISLAND.

To the Editor of the "Nautical Magazine."

SIR,—On my last passage to the Black Sea I noticed a building, evidently intended for a Lighthouse, on the south end of Sapienza Island, lat. 36° 44′ N., long. 21° 42′ E.: the building appeared to be quite new. Not having seen, in any publication, notice of a light there I do not know whether it is intended to exhibit one,

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No.	
72	CHINA—E. Coa
73	AUSTRALIA—E.
74	"
75	SOUTH AUSTRA
76	NORTH PACIFIC
77	CANADA — Nova
78	" St.

All Bea

38.—ENGLAND. *tion in Character* the following alter Dudgeon light-ve light (at present f *white flash* and *o* sion *every half-mi* equal in power wi tions of time will *two and a half sec* ness, *twenty-two a*

39.—ENGLAND. *ution in charact* accelerate the rev light-vessel, entr revolving white *every ten seconds.*

40.—ENGLAND. view of facilitatin Blakeney Overfall an 8-feet conical girdle sand. Als to mark the Gore

perhaps you may be able to give us the desired inform through the medium of your pages. A good light on Sapi would be of great service to ships bound to the Levant.

I am, sir, yours respectfully,

Antwerp, 9th April, 1882. A CONSTANT READE

[Notice was given some time ago that it was intended to a lighthouse on Thio Adelphi, south point of Sapienza Is We are glad to hear that the building has made such pro Particulars of the character of the light have not yet published; when they are, they will be given in our "Not Notices."—ED. *N. M.*]

ASTOVE ISLAND, MOZAMBIQUE CHANNEL.

To the Editor of the "Nautical Magazine."

DEAR SIR,—I enclose abstract from my Note-book, relati the Island of Astove near the Cosmoledo Group, N entrance to the Mozambique Channel; as the Isl published in the latest edition of the "African Pilot," Vol. is very meagre, I thought, perhaps, my remarks might be I took a number of bearings and distances of prominent and objects while steaming around, at a distance of from two to one mile; I did not stop at all, but examined the island with a powerful telescope, especially after seeing the flag but could see no traces of any person on the island.

Extract from Note-book:—Saturday, 4th March, 1882, 10-15 observed "Astove Island" right a-head. It makes like a num of small islands (tops of hummocks covered with sc trees), the whole nearly base soon after coming in sight (appearing as in N.E. corner). Steered to about two miles (N. point near which there is an isolated rock); then alte Island lie nearly parallel to the South side; which is 3½ miles distant one and a half mile low small reef extending about half a mile and steep-to on the other side. Anchored in 10 fathoms, this bearing to be about

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be three inlets, one on the South
e East side the edge of the shoal
, about two cables off the beach,
eak. About two miles from the
a low point, and a little South of
nous; examined the island very
o other indications of any person
t (which falls back a little from the
tance along the North side, there
niles, on which the sea breaks

two points, the edge of the reef
ve could see no indication of any

flagstaff to be lat. 10° 7′ S., long.
and p.m. observations, with chrono-
nd whose rates were checked the
nd, Mayotta.

BARHAM,

Master s.s. *Clan Macleod*.

of Astove Island is within 1½ mile
hat given in the "African Pilot" is
rvey of the vicinity is greatly wanted;
n of Astove Island.—Ed. *N. M.*]

COAL PORTS.

the "Nautical Magazine."

your last issue a statement furnished
nts, "W. T." of the "Coal Exports"
ary last from Cardiff as against those
the latter port is made to compare
mer, and with its own previous history.
y your Correspondent giving a part only
l thereby (unintentionally, no doubt),
ur readers.

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perhaps you may be able to give us the desired information through the medium of your pages. A good light on Sapienza would be of great service to ships bound to the Levant.

I am, sir, yours respectfully,

Antwerp, 9th April, 1882. A CONSTANT READER.

[Notice was given some time ago that it was intended to erect a lighthouse on Thio Adelphi, south point of Sapienza Island. We are glad to hear that the building has made such progress. Particulars of the character of the light have not yet been published; when they are, they will be given in our "Nautical Notices."—ED. *N. M.*]

ASTOVE ISLAND, MOZAMBIQUE CHANNEL.

To the Editor of the "Nautical Magazine."

DEAR SIR,—I enclose abstract from my Note-book, referring to the Island of Astove near the Cosmoledo Group, Northern entrance to the Mozambique Channel; as the information published in the latest edition of the "African Pilot," Vol. III., is very meagre, I thought, perhaps, my remarks might be useful. I took a number of bearings and distances of prominent points and objects while steaming around, at a distance of from two miles to one mile; I did not stop at all, but examined the island carefully with a powerful telescope, especially after seeing the flagstaff, but could see no traces of any person on the island.

Extract from Note-book:—Saturday, 4th March, 1882, 10-15 a.m., observed "Astove Island" right a-head. It makes like a number of small islands (tops of hummocks covered with short brush), the white sandy base soon after coming in sight (approaching on a N.E. course). Steamed to about two miles off S.W. point, near which there is an isolated rock; then steered East for two miles nearly parallel to the South side; rounded S.E. point, distant one and a half mile, low and rocky with breakers extending about half a mile and green water about a mile off in a S.S.E. direction; then hauled in to about one mile off the

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East coast. There appears to be three inlets, one on the South coast and two on the East; on the East side the edge of the shoal water was very distinctly defined, about two cables off the beach, on which there was very little break. About two miles from the South point, saw a flagstaff near a low point, and a little South of it two cocoa palms very conspicuous; examined the island very carefully with glass, but saw no other indications of any person on the island. Off the North point (which falls back a little from the line of coast), and for some distance along the North side, there extends a shoal for about two miles, on which the sea breaks very heavily.

With the exception of these two points, the edge of the reef seems to be quite bold, and we could see no indication of any detached danger.

I made the position of the flagstaff to be lat. 10° 7′ S., long. 47° 49′ E., by a number of a.m. and p.m. observations, with chronometers going very regularly, and whose rates were checked the day previously at Pamanzi Island, Mayotta.

W. H. BARHAM,

Master s.s. *Clan Macleod.*

Bombay, 18th March, 1882.

[Captain Barham's position of Astove Island is within 1½ mile of recent determinations. That given in the "African Pilot" is erroneous in longitude. A survey of the vicinity is greatly wanted; and very little is really known of Astove Island.—Ed. *N. M.*]

OUR COAL PORTS.

To the Editor of the "Nautical Magazine."

Dear Sir,—I observe in your last issue a statement furnished by one of your Correspondents, "W. T." of the "Coal Exports" during the month of January last from Cardiff as against those from the Tyne—in which the latter port is made to compare unfavourably with the former, and with its own previous history.

This is brought about by your Correspondent giving a part only of the Tyne figures, and thereby (unintentionally, no doubt), misleading himself and your readers.

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The correct figures are—

Coal (including patent fuel).		
Cardiff—Foreign	492,985	tons
Coastwise	78,771	,,
Total ...	571,756	,,
Tyne—Foreign	321,495	,,
Coastwise	308,577	,,
Total ...	628,072	,,
Showing	56,316	,,

in favour of the Tyne.

Coal and Coke.		
Cardiff—Foreign	493,146	tons
Coastwise	78,846	,,
Total ...	571,992	,,
Tyne—Foreign	342,242	,,
Coastwise	306,954	,,
Total ...	649,196	,,
Excess of the Tyne over Cardiff ...	77,204	,,

The Tyne may therefore still lay claim to the "proud position" it has hitherto occupied as our leading coal port.

I am, yours truly,

Newcastle, April 4, 1882. R. URWIN.

NIGHT SIGNALLING.

To the Editor of the "Nautical Magazine."

Sir,—Having read the article about night signals, in the March number of *Nautical Magazine*, I find that an "Officer in the Mail Steamer" proposes to substitute for a night signal system, the ball, the square flag and the pennant, in the "distance signals," prescribed for ships at daytime by law of 1st of April, 1866, with respectively a red, green and bright light.

As I have had this very same idea, and in 1871, as in 1876, worked

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out a plan and constructed apparatus with lanterns for signalling purposes, I hereby take the liberty to ask you kindly to allow me to make this known through your Journal, and to state that I shall be glad to show to anyone who may be interested in the matter the details of my method.

I remain, with the highest regard, yours obedient,

S. A. PHILIPSEN,
Master of the s.s. *Ansgar*, of Copenhagen,
Amaliegade, No. 21.

Rouen, April 3, 1882.

SHIPBUILDING, 1882.

IRON AND STEEL STEAMERS BUILT IN THE UNITED KINGDOM, AND REGISTERED AS NEW BRITISH SHIPS.

Ports where built.	No. first three months.	Gross Tonnage first three months.	No. corresponding period last year.	Gross Tonnage corresponding period last year.
Clyde Ports ...	22	48,929	31	46,993
Tyne Ports (Including Blyth.)	21	30,460	16	23,917
Sunderland ...	16	26,351	6	9,981
The Hartlepools	8	14,838	6	8,740
Middlesbro' ...	1	2,460	2	1,497
Stockton ...	4	7,702	3	5,341
Whitby ...	1	2,216	1	1,393
London ...	3	329	4	325
Liverpool ...	2	2,650	2	3,150
Barrow ...	1	4,196	3	6,557
Belfast ...	1	4,189	5	9,086
Hull ...	2	4,598	2	3,926
Whitehaven ...	1	1,217	1	295
Aberdeen ...	2	2,059	4	4,620
Grangemouth	—	—	1	180
Dundee ...	4	5,806	2	1,913
Leith ...	2	1,880	3	1,639
Other Ports ...	6	1,455	1	134
Total ...	97	161,385	93	129,687

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IRON AND STEEL SAILING SHIPS BUILT IN THE UNITED KINGDOM AND REGISTERED AS NEW BRITISH SHIPS.

Ports where built.	No. first three months.	Gross Tonnage first three months.	No. corresponding period last year.	Gross Tonnage corresponding period last year.
Clyde ...	9 ...	5,397 ...	2 ...	2,318
Stockton ...	1 ...	1,712 ...	— ...	—
Liverpool ...	3 ...	5,591 ...	2 ...	3,318
Aberdeen ...	1 ...	493 ...	1 ...	1,383
Southampton	3 ...	6,004 ...	2 ...	2,951
Cumberland Ports	2 ...	2,898 ...	— ...	—
Belfast ...	1 ...	2,347 ...	— ...	—
Dundee ...	1 ...	895 ...	— ...	—
London ...	2 ...	542 ...	— ...	—
Small Ports...	— ...	— ...	2 ...	332
Total ...	23	25,879	9	10,302

STEEL STEAMERS BUILT IN THE UNITED KINGDOM AND REGISTERED AS BRITISH SHIPS.

Ports where built.	No. first three months.	Gross Tonnage first three months.	No. corresponding period last year.	Gross Tonnage corresponding period last year.
Clyde ...	4 ...	13,859 ...	3 ...	10,637
Tyne ...	1 ...	190 ...	1 ...	67
Belfast ...	1 ...	4,189 ...	1 ...	7,117
Liverpool ...	1 ...	894 ...	1 ...	927
London ...	1 ...	56 ...	— ...	—
Barrow ...	1 ...	4,196 ...	— ...	—
Dundee ...	1 ...	4,043 ...	— ...	—
Total ...	10	27,387	7	18,748

In the first three months of 1882 there has been also one steel sailing ship on the Clyde of 1,361 tons, and one at Belfast of 2,347 tons. There were none last year.

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MARINE INVENTIONS.

Monthly List of Patents—Compiled for this Journal by Messrs. W. P. Thompson and Boult, British and International Patent and Trademark Agents and Consulting Engineers, 323, High Holborn, London, W.C.; and Berridge Street, Leicester; also by Messrs. W. P. Thompson & Co., 6, Lord Street, Liverpool.

ENGLISH (APPLICATIONS).

1341. James Wills, of Leicester. "Improvements in thrust bearings for screw-propeller shafts and other similar shafts."

1417. William Smith, of Aberdeen, N.B. "Improvements in apparatus for excavating or dredging under water, and an improved dredging hopper for raising and removing the material excavated."

1430. A. M. Clark. (A communication from Kittel Anunsen, of Winchester, Winnebago, Wisconsin, U.S.A.) "Improved means or apparatus for obtaining power upon ships or vessels."

1436. John Tell Cressley, of Glasgow. "Improvements in adapting certain parts of ships' furniture for use in saving life."

1443. Joseph Armstrong, of Wellington Street, New Swindon, Wilts. "Improved means or appliances for measuring and indicating the rate of motion of a ship or other body through water and the speed or volume of currents of water or other liquids."

1524. James Jacques, of Grundy Street, Poplar, Middlesex. "Improvements in buoys for signalling and other purposes."

1668. William Nelson Hutchinson, of Wellesbourne, near Bideford, Devon. "Improvements in submarine torpedoes, and in appliances for projecting these and other torpedoes, and for giving security to the persons engaged in laying down or removing submarine torpedoes."

1704. Ebenezer John Robinson, of Ipswich, Suffolk. "Improvements in rowlocks."

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1767. The Honourable Francis George Crofton, of Kingstown, Dublin, Ireland. "Improvements in apparatus for disengaging boats when lowered from ship's davits or when hoisted out by derrick or steam crane."

1806. Alfred Leslie Stanley Leighs, of 113, Borough Road, Southwark. "A new or improved casing for ships' torpedo boats or to be worn on the person."

BELGIUM.

57182. J. Robertson, of Glasgow. "Improvements in ship propellers.

57369. J. S. Kauser and J. Schamorizi, of Buda Pesth. "A steam dredger with a circular motion of the ladder."

57386. J. Gardner, of London. "A contrivance for keeping berths, &c., in a horizontal position."

CANADIAN.

13792. Lewis P. Fairbanks, of Dartmouth, N.S. "Improvements in steam-vessels.

13830. David Urch, of Portsmouth, N.H., U.S. "Improvements in boats."

13874. James H. Porter, of Boston, Mass. U.S. "Improvements in self-levelling berths for vessels."

FRENCH.

144341. Nordenfelt. "Improvements in submarine boats."

GERMAN.

17911. R. P. Pictet, of Geneva. "A hull of ships."

17969. W. H. Mallory, of Bridport, U.S. "A torpedo."

ITALIAN.

13491. A. D. Roth, of Blackheath. "Apparatus for saving life and valuable objects at sea."

13655. P. Brotherwood, of London. "An apparatus for launching torpedoes under water."

PATENTS PUBLISHED.

3488. August 12, 1881. Price 6d. John Wilkinson, of Park Road, Blackpool, in the County of Lancaster, Gentleman. "An improved system of screw propulsion for accelerating the

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speed of ships, boats, and other vessels through water." Two shafts are used to work at the stern and a long "screw-race" below the hull is provided, upon each of the shafts are fixed a series of single propeller-blades, those on one shaft being designed for right-hand motion, and those on the other for left-hand motion; all the propeller blades are set at suitable distances (one behind the other) upon their shafts, and one shaft is an exact counterpart of the other. The two shafts are so mounted that the propeller-blades work in pairs "alternately and towards each other." The shafts are so mounted that they may be uncoupled, and then will assist in the manipulation of the vessel.

3724. August 26, 1881. Price 8d. Alexander Milburn Wellington Samson, of The Elms, Northolt, near Southall, in the county of Middlesex, a major on half-pay in her Majesty's army. "An improved construction of ship, whereby rolling and pitching are reduced to a minimum, and which renders vessels practically unsinkable." The invention consists in building a ship on three keels. Three separate keels are laid down, two lower keels and one upper keel. The two lower keels form the base of the vessel, the third is between and above them. The lower keels run in parallel straight lines from the ends or point at which the stern posts are to be built towards the stem or bow until they reach the required distance from the bow, and then curve towards each other to the stem, where they meet, thus forming the bow. The inner, lower part of the stem receives the end of the third or centre keel, as will hereinafter appear. At the stern-ends of the lower keels two stern posts are built, which are of extra thickness inboard, and carry a transverse girder of sufficient strength to support, at its centre, the midships keel, which runs thence to the stem, where it is built to the other two keels. The outer ribs of the vessel are arranged as may be most desirable. The ribs between the lower keels and the centre keel are so arranged as to give the water an uninterrupted run from the bow aft throughout the length of the ship, and out between the two stern posts. The ship's draught of water will alway be such that the centre keel rests in or on the water. Ribs built from the centre keel to the outer keels afford facility for forming watertight bulkheads.

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TIDE TABLES FOR MAY, 1882.

Also Ports of Reference for the Constants in the next Table.

Week Day.	Month Day.	LONDON BRIDGE.		HULL.		NORTH SHIELDS		LEITH.		DEVONPORT.		DOVER.		WESTON-SUPER-MARE.		LIVERPOOL.		GREENOCK.		QUEENSTOWN.		KINGSTOWN		LONDONDERRY.		BREST.	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
		H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
M	1	0 35	0 54	5 4	5 21	2 3	2 20	0 57	1 15	4 8	4 29	9 38	9 57	5 18	5 39	9 55	10 13	10 35	10 54	3 29	3 48	9 49	10 6	6 35	6 53	2 20	2 38
Tu	2	1 12	1 32	5 38	5 57	2 37	2 54	1 33	1 51	4 49	5 8	10 17	10 37	6 0	6 20	10 31	10 48	11 14	11 34	4 7	4 26	10 23	10 39	7 11	7 29	2 56	3 18
W	3	1 49	2 5	6 16	6 34	3 10	3 27	2 8	2 25	5 26	5 44	10 57	11 17	6 39	6 58	11 5	11 23	11 53	—	4 45	5 4	10 55	11 12	7 47	8 5	3 30	3 48
Th	4	2 22	2 38	6 52	7 10	3 44	4 2	2 42	2 59	6 2	6 20	11 37	11 57	7 17	7 35	11 42	—	0 12	0 31	5 23	5 42	11 30	11 49	8 22	8 39	4 6	4 24
F	5	2 57	3 14	7 29	7 48	4 21	4 40	3 17	3 35	6 38	6 56	—	0 17	7 53	8 11	0 1	0 20	0 50	1 9	6 1	6 20	—	0 8	8 56	9 13	4 43	5 2
S	6	3 34	3 53	8 7	8 26	4 59	5 19	3 54	4 14	7 14	7 32	0 37	0 58	8 30	8 50	0 39	0 58	1 28	1 47	6 39	7 0	0 28	0 48	9 31	9 51	5 21	5 41
S	7	4 13	4 34	8 46	9 7	5 40	6 2	4 35	4 57	7 52	8 12	1 20	1 43	9 10	9 30	1 18	1 38	2 7	2 28	7 22	7 44	1 9	1 31	10 12	10 35	6 2	6 25
M	8	4 54	5 16	9 30	9 55	6 26	6 52	5 21	5 48	8 33	8 56	2 7	2 32	9 50	10 11	2 1	2 25	3 50	3 14	8 6	8 30	1 56	2 22	11 0	11 31	6 49	7 16
Tu	9	5 41	6 7	10 22	10 53	7 30	7 51	6 16	6 46	9 21	9 49	2 57	3 24	10 34	11 0	2 50	3 18	3 39	4 7	8 56	9 24	2 49	3 18	—	0 9	7 45	8 15
W	10	6 34	7 6	11 29	—	8 26	9 3	7 20	7 57	10 19	10 51	3 53	4 22	11 28	11 59	3 48	4 22	4 37	5 8	9 53	10 24	3 51	4 27	0 51	1 34	8 46	9 19
Th	11	7 39	8 12	0 6	0 42	9 40	10 18	8 34	9 11	11 27	—	4 51	5 21	—	0 33	4 58	5 36	5 40	6 14	10 58	11 35	5 2	5 37	2 16	2 54	9 54	10 33
F	12	8 50	9 29	1 17	1 51	10 55	11 29	9 48	10 22	0 6	0 47	5 52	6 25	1 9	1 45	6 17	6 54	6 50	7 25	—	0 10	6 12	6 44	3 29	3 59	11 11	11 46
S	13	10 5	10 38	2 23	2 54	—	noon	10 53	11 21	1 27	2 3	7 0	7 33	2 21	2 56	7 28	7 58	7 58	8 30	0 45	1 19	7 14	7 44	4 26	4 49	—	0 18
S	14	11 11	11 42	3 13	3 52	0 28	0 55	11 48	—	2 36	3 7	8 4	8 33	3 30	4 4	8 27	8 54	9 1	9 31	1 51	2 22	8 14	8 43	5 12	5 35	0 48	1 17
M	15	—	0 10	4 21	4 46	1 21	1 46	0 14	0 40	3 35	4 2	9 1	9 28	4 37	5 8	9 19	9 44	9 59	10 26	2 51	3 19	9 11	9 38	5 59	6 23	1 43	2 9
Tu	16	0 35	1 2	5 11	5 35	2 10	2 33	1 6	1 30	4 28	4 53	9 55	10 21	5 36	6 3	10 8	10 32	10 52	11 18	3 46	4 11	10 2	10 24	6 47	7 11	2 34	2 58
W	17	1 28	1 51	5 59	6 23	2 56	3 18	1 54	2 17	5 16	5 39	10 46	11 11	6 29	6 53	10 56	11 19	11 43	—	4 36	5 0	10 46	11 8	7 35	7 59	3 22	3 45
Th	18	2 11	2 33	6 47	7 10	3 40	4 2	2 38	2 58	6 1	6 23	11 36	11 59	7 16	7 38	11 41	—	0 7	0 30	5 23	5 45	11 30	11 52	8 21	8 41	4 7	4 28
F	19	2 55	3 17	7 32	7 53	4 23	4 44	3 18	3 39	6 43	7 2	—	0 22	7 58	8 18	0 8	0 24	0 52	1 14	6 6	6 27	—	0 13	9 0	9 19	4 49	5 9
S	20	3 38	3 59	8 14	8 34	5 5	5 26	4 0	4 22	7 20	7 38	0 45	1 7	8 38	8 57	0 45	1 6	1 35	1 55	6 48	7 8	0 34	0 56	9 38	9 58	5 29	5 49
S	21	4 20	4 41	8 54	9 14	5 47	6 9	4 44	5 6	7 56	8 14	1 29	1 50	9 15	9 33	1 26	1 46	2 15	2 35	7 28	7 48	1 18	1 40	10 18	10 39	6 9	6 29
M	22	5 0	5 18	9 35	9 56	6 31	6 53	5 28	5 50	8 32	8 51	2 11	2 32	9 51	10 8	2 0	2 26	2 55	3 15	8 8	8 28	2 2	2 24	11 2	11 29	6 50	7 12
Tu	23	5 39	6 2	10 19	10 43	7 16	7 41	6 13	6 37	9 11	9 31	2 53	3 15	10 26	10 45	2 46	3 8	3 36	3 58	8 48	9 9	2 46	3 9	11 59	—	7 35	7 58
W	24	6 26	6 49	11 10	11 38	8 8	8 36	7 3	7 31	9 52	10 16	3 37	4 0	11 6	11 29	3 31	3 57	4 20	4 44	9 31	9 54	3 33	4 0	0 31	1 5	8 22	8 48
Th	25	7 14	7 40	—	0 9	9 5	9 37	7 59	8 30	10 42	11 10	4 23	4 47	11 56	—	4 25	4 55	5 9	5 36	10 20	10 50	4 29	4 59	1 40	2 15	9 16	9 47
F	26	8 9	8 41	0 39	1 9	10 10	10 42	9 3	9 36	11 43	—	5 14	5 42	0 25	0 56	5 28	6 3	6 6	6 37	11 22	11 54	5 30	6 0	2 48	3 19	10 20	10 53
S	27	9 14	9 50	1 39	2 8	11 13	11 42	10 7	10 35	0 19	0 55	6 10	6 39	1 28	2 0	6 36	7 7	7 9	7 39	—	0 25	6 28	6 56	3 46	4 11	11 25	11 56
M	28	10 21	10 52	2 56	3 33	—	0 9	11 2	11 28	1 29	2 1	7 9	7 39	2 31	3 2	7 37	8 5	8 8	8 37	0 56	1 26	7 23	7 50	4 34	4 56	—	0 25
Tu	29	11 21	11 47	3 39	4 16	0 35	0 59	11 53	—	2 31	3 0	8 8	8 34	3 33	4 3	8 31	8 55	9 5	9 31	1 55	2 23	8 17	8 43	5 17	5 37	0 52	1 18
W	30	—	0 11	4 21	4 44	1 22	1 43	0 16	0 37	3 26	3 50	8 58	9 21	4 32	4 58	9 17	9 38	9 56	10 19	2 48	3 11	9 8	9 31	5 57	6 18	1 41	2 3
Th	31	0 33	0 33	5 5	5 25	2 1	2 20	0 58	1 19	4 13	4 36	9 43	10 5	5 24	5 47	9 58	10 18	10 41	11 3	3 34	3 56	9 53	10 11	6 39	7 0	2 24	2 44

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TIDAL CONSTANTS

For Various British, Irish, and European Ports.

By applying the Tidal Constant of the place, according to its sign (+ *add*, − *sub.*), to the time of high water on the given day at the port of reference, you have the time of high water at the place sought.

Place.	Constant. H. M.	Port of Reference.
Aberdeen	−1 17	Leith
Aberystwyth	−3 52	Liverpool
Alderney	+2 50	Brest
Antwerp	+5 13	Dover
Arbroath	−0 42	Leith
Arcachon	+0 50	Brest
Arklow	−2 25	Kingstown
Ayr	−0 18	Greenock
Banff	−1 49	Leith
Bantry harbour	−1 14	Queenstown
Barnstaple bridge	−0 26	Weston-s.-Mare
Bayonne	−0 2	Brest
Beachy head & Rye bay	+0 8	Dover
Beaumaris	−0 51	Liverpool
Belfast	+2 42	Londonderry
Berwick	−1 5	N. Shields
Blyth	−0 8	N. Shields
Bordeaux	+3 3	Brest
Boulogne	+0 18	Dover
Bridport	+0 22	Devonport
Bristol & King Road	+0 19	Weston-s.-Mare
Cadiz	−2 2	Brest
Caernarvon	−1 56	Liverpool
Calais	+0 37	Dover
Campbelltown	−0 23	Greenock
Cardiff	+0 2	Weston-s.-Mare
Cardigan bar	−4 22	Liverpool
Carlingford bar	−0 10	Kingstown
Chatham	−0 47	London
Cherbourg	+4 2	Brest
Coleraine	−1 37	Londonderry
Coquet Road	−0 23	N. Shields
Cordouan Tower	−0 10	Brest
Cowes (West)	−0 27	Dover
Crinan	+4 41	Greenock
Cromarty	−2 21	Leith
Dartmouth	+0 33	Devonport
Deal & Downs	+0 8	Dover
Dieppe	+7 19	Brest
Donaghadee	+0 8	Kingstown
Donegal harbour	+0 17	Queenstown
Douglas & Ramsay	−0 11	Liverpool
Dublin bar	+0 2	Kingstown
Dundalk	−0 16	Kingstown
Dungeness	−0 27	Dover
Dunkerque	+0 56	Dover
Exmouth	+0 38	Devonport
Falmouth	−0 46	Devonport
Fecamp	+6 57	Brest
Ferrol	−0 47	Brest
Flamborough head	−1 59	Hull
Fleetwood	−0 12	Liverpool
Folkestone	−0 5	Dover
Fowey	−0 29	Devonport
Flushing	+1 42	Dover
Galway bay	−0 26	Queenstown
Gibraltar	−1 27	Brest
Glasgow (Port)	+0 10	Greenock
Gloucester	+2 51	Weston-s.-Mare
Granville	+2 26	Brest
Gravesend	−0 48	London
Grimsby (Great)	−0 53	Hull
Guernsey (St. Peter)	+2 50	Brest
Hartlepool	+0 5	N. Shields
Harwich	−1 52	London
Havre	+6 4	Brest
Helgoland	+0 21	Dover
Holyhead	−1 12	Liverpool
Holy Island harbour	−0 53	N. Shields
Honfleur	+5 42	Brest
Inverness	−1 59	Leith
Jersey (St. Helier)	+2 38	Brest
Kinsale	−0 18	Queenstown
Lerwick (Shetland)	−3 47	Leith
Limerick	+1 15	Queenstown
Lisbon bar	−1 17	Brest
Littlehampton	+0 24	Dover
Llanelly bar	−0 38	Weston-s.-Mare
Lowestoft	−4 1	London
Lynn & Boston Deep	−0 29	Hull
Margate	−2 18	London
Maryport	+0 3	Liverpool
Milford Haven entr.	−0 58	Weston-s.-Mare
Montrose	−0 52	Leith
Morlaix	+1 6	Brest
Needles point	−1 26	Dover
Newcastle	+0 23	N. Shields
Newhaven	+0 39	Dover
Newport	+0 16	Weston-s.-Mare
Nieuport	+1 6	Dover
Nore	−1 28	London
Orfordness	−2 43	London
Oporto	−1 17	Brest
Ostende	+1 13	Dover
Padstow	−1 41	Weston-s.-Mare
Peel, Isle of Man	−0 15	Liverpool
Pembroke Dock	−0 42	Weston-s.-Mare
Penzance	−1 13	Devonport
Peterhead	−1 48	Leith
Piel harbour, Barrow	−0 18	Liverpool
Plymouth breakwater	−0 6	Devonport
Poole	−2 2	Dover
Port Carlisle	+0 47	Liverpool
Portland breakwater	+1 18	Devonport
Port Patrick	−0 58	Greenock
Portsmouth	+0 29	Dover
Ramsgate	−2 19	London
Rotterdam	+4 33	Dover
Santander	−0 17	Brest
Scarborough	+0 48	N. Shields
Selsea bill	+0 33	Dover
Sheerness	−1 21	London
Shoreham	+0 22	Dover
Sligo bay	+0 17	Queenstown
Southampton	−0 42	Dover
Spurn point	−1 3	Hull
St. Ives	−2 10	Weston-s.-Mare
St. Malo	+2 18	Brest
St. Mary (Scilly)	−1 16	Devonport
St. Nazaire	−0 7	Brest
Stornoway	+6 38	Greenock
Stromness (Orkneys)	−5 17	Leith
Sunderland	−0 1	N. Shields
Swansea bay	−0 53	Weston-s.-Mare
Tay bar	−0 11	Leith
Tees bar	+0 22	N. Shields
Tenby	−1 12	Weston-s.-Mare
Thurso	−5 49	Leith
Torbay	+0 17	Devonport
Tralee bay	−0 58	Queenstown
Ushant (Ouessant)	−0 15	Brest
Valentia harbour	−1 19	Queenstown
Waterford	+0 19	Queenstown
Westport	−0 4	Queenstown
Wexford	+2 20	Queenstown
Whitby	+0 22	N. Shields
Whitehaven	−0 9	Liverpool
Wick	−2 55	Leith
Wicklow	−0 41	Kingstown
Workington	−0 19	Liverpool
Yarmouth road	−4 43	London
Youghall	+0 13	Queenstown

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MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
149	England—East Coast—The Wash	New buoys.
150	„ West Coast—Bristol Channel —Trevose Head	Light to be made occulting.
151	Ireland—East Coast—Codling Bank Light-vessel	Siren fog trumpet proposed.
152	„ N.W. Coast—Donegal Harbour	Blind rock perch washed away.
153	France—North Coast—Roches de St. Quay—Harbour Isle	Fog-signal altered in position.
154	North Sea—East Schelde—Schouwen Island Light	Intended alteration in character.
155	„ Jade River Entrance—Schillighorn	Exhibition of provisional light.
156	„ Jutland—West Coast—Klitmöller	Establishment of fishing lights.
157	Mediterranean—Sardinia—Porto Torres	New leading lights.
158	„ Italy—Strait of Messina	Light marking cable, &c.
159	Black Sea—Bug River—Sievers Point	Leading lights altered in colour.
160	„ Kertch Strait	Depth on shoal.
161	„ Poti	Leading lights altered in colour.
162	„ Batoum	Alteration in lights.
163	North Atlantic—Azores—Fayal Island —Horta Bay	Light on Breakwater.
164	Africa—East Coast—Quilimane River	Buoyage of entrance.
165	South Indian Ocean—Seychelle Islands —Dennis Island	New light.
166	India—West Coast—Beypore	Pillar to mark south boundary of port.
167	„ „ Cape Modeshwar	Discovery of sunken danger.
168	„ „ Bombay Harbour	Position of fishing stakes.
169	„ Bay of Bengal—Hoogly Approaches	Position of Pilot's Ridge light-vessel.
170	„ „ Chittagong River	Changes in the river bar.
171	South Australia—Spencer Gulf—Wallaroo Bay	Light on new jetty.
172	South America—Magellan Strait—Sandy Point Road	Buoy marking wreck of H.M.S. *Doterel* not in position.
173	West Indies—New Granada—Cartagena	New light.
174	United States—Gulf of Mexico—Louisiana—Amite River	New light.
175	„ „ Florida—Cape San Blas	New light.
176	„ Maryland—Hooper Strait and Clay Island	Rays of red light.
177	„ New Jersey—Five Fathom Bank	New light-vessel on N.E. end.
178	„ Maine—Boon Island	New whistling buoy.
179	Nova Scotia—Sable Island	Light destroyed by sea.
180	Gulf of St. Lawrence—Cape Breton Island—Cape North Lighthouse	Position.

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NAUTICAL NOTICES.

All Bearings Magnetic, unless otherwise stated.

149.—ENGLAND.—*East Coast.—Buoyage of the Wash.*—In accordance with previous Notice, an 8-ft. *red and white chequered conical buoy, with red staff and cage*, marked Bridgirdle, has been placed northward of all the shoal patches of the Bridgirdle sand, and lies in 4¼ fathoms at low water spring tides, with the following marks and bearings, viz. :—A roadway in line with the middle of the High Scald head, S.W. ¼ W.; Burnham High Mill, midway between two woods, S. by W. ¼ W.; Holkham church, its length eastward of a gap in the park trees, S. by E.; the Scalp beacon in line with the south end of Stiffkey wood, S.E. ¼ S.; Blakeney Overfalls buoy, E. by S., distant $10\frac{1}{10}$th miles; Woolpack buoy, N.W. by W. ¼ W., distant $7\frac{7}{10}$ths miles; Gore Middle buoy, W. ¼ N., distant $6\frac{2}{10}$ths miles; also, an 8-ft. *red conical buoy with red staff and globe*, marked Gore Middle, has been placed at the east end of the Gore Middle sand, and lies in 14 ft. at low water spring tides, with the following marks and bearings, viz. :—Holme church, twice its length eastward of a large barn, S.W. ¼ S.; Docking church, just open eastward of a roadway at Thornham, south; Brancaster lifeboat house, its length on the high eastern trees at Burnham, S.E. ¼ S.; Bridgirdle buoy, E. ¼ S., distant $6\frac{2}{10}$ths miles; the High Scald head, S.E. by E. ¼ E., distant $4\frac{8}{10}$ths miles; Hunstanton lighthouse, S.W. by W. ¼ W., distant 4 miles.

150.—ENGLAND.—*West Coast (Cornwall), and Bristol Channel. —Trevose Head.—Entire Alteration in Character of Light.*—Early in June, the Trevose low light will be discontinued, and the high light made occulting. The light will be under occultation three times in quick succession every minute: that is to say, it will suddenly disappear for *three seconds*, and then as suddenly reappear at full power for *three seconds*; again suddenly disappear for *three seconds*, reappear at full power for *three seconds*; again disappear for *three seconds*, and suddenly reappear at full power

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for the remainder of the minute. Further notice will be given when this alteration has been effected.

151.—IRELAND.—*East Coast.—Fog-Signal at Codling Bank Light-Vessel.*—On and after the 1st day of July next, a powerful fog-siren trumpet will be sounded on board the Codling bank light-vessel during thick and foggy weather, giving *three blasts every two minutes*, in the following order:—blast = $1\frac{2}{3}$ seconds, interval = 5 seconds; blast = $1\frac{2}{3}$ seconds, interval = 5 seconds; blast = $1\frac{2}{3}$ seconds, interval = 105 seconds.

152.—IRELAND.—*N.W. Coast.—Donegal Harbour.—Blind Rock Perch Washed Away.*—This perch, on the western side of entrance to Donegal harbour, was washed away during a gale in October, 1881, and has not been replaced.

153.—FRANCE.—*North Coast.—Roches de St. Quay.—Fog-Signal at Harbour Isle Lighthouse.*—The fog-signal (trumpet) previously established at Portrieux jetty lighthouse, has been transferred to the lighthouse at Harbour isle, the principal rock of St. Quay group. During thick or foggy weather, the trumpet will be sounded as before, in the following order—fourteen blasts at intervals of *one second*, an interval of *six seconds*, a double blast, another interval of *six seconds*, followed by fourteen blasts.

154.—NORTH SEA.—*East Schelde.—Schouwen Island Light.—Intended Alteration in Character.*—The revolving light will be discontinued, and in place thereof a *double flashing half-minute* light of the first order will be exhibited, showing *two flashes* of *two and a-quarter seconds*' duration each, divided by an eclipse of *five and a-quarter seconds*' duration; the second flash being followed by an eclipse of *twenty and a-quarter seconds.*

Note.—In order to carry out this alteration, the revolving light will be discontinued at the end of April, 1882, and will be temporarily replaced by a *fixed and flashing* light of less power, to be exhibited from the same lighthouse, with an old illuminating apparatus of the fourth order. Further particulars concerning the alteration will be published in due course.

155.—NORTH SEA.—*Jade River Entrance.—Schillighörn.—Discontinuance of Lights.—Exhibition of Provisional Light.*—According to previous Notices the demolition of Schillighörn light-

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house would take place on 20th March, 1882, on which date the two lights would be discontinued, and the provisional light would be exhibited. This light, shown from near the angle of the sea wall at Schilligḧrn, is a *fixed red* light, elevated about 23 feet above high water, and visible between the bearings of S. by E. (through west) and N.N.W. from a distance of 5 miles. Position, lat. 53° 42′ 20″ N., long. 8° 1′ 30″ E. *Variation*, 14° *W.*

156.—North Sea.—*Jutland.—West Coast.—Fishing Lights at Klitmöller.*—Two fishing lights exhibited at Klitmöller, northward of Orhage, about 5½ miles south-westward of Hanstholm; they are *fixed red* lights, visible from a distance of about 3 or 4 miles. The low light, elevated 15 feet above the sea, shown from a pole situated 40 yards from the shore; the high light, elevated 30 feet above the sea, bears S.S.E. ¾ E. from the low light, distant 60 yards. These lights will be exhibited from 1st April to 1st May; and from 15th August to 15th November. Position, lat. 57° 2′ 30″ N., long. 8° 29′ 0″ E. *Variation*, 14¼° *W.*

157. — Mediterranean. — *Sardinia.—North Coast.—Leading Light at Porto Torres.*—Exhibited from above the fountain on the southern embankment at Porto Torres, south shore of the gulf of Asinara; it is a *fixed red* light, and bears S. 47½° W. from the fixed white light on the eastern mole head, distant 283 yards; elevated 16 feet above the sea, and visible 3 miles; fountain painted white and gray in stripes. Entering porto Torres, the red light should be kept slightly open westward of the white light—the eastern mole head should be rounded at a distance of about 25 yards—and when within the entrance, the vessel should at once haul to the eastward, as on the west side of the port the water shoals quickly. *Variation*, 12¾° *W.*

158.—Mediterranean.—*Italy.—Strait of Messina.*—(1.) *Cape Faro.—Light Marking Telegraph Cable, Anchorage Prohibited.*—A light is now exhibited on Mazzone point, about one mile westward of Cape Faro (Peloro), north-east extreme of Sicily, to mark the position where the telegraph cable laid between Bagnara and Cape Faro is landed. It is a *fixed green* light of small power, visible from a distance of one mile. Position approximate, lat. 38° 16′ 5″ N., long. 15° 38′ 20″ E. The telegraph cables, laid across the strait

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of Messina, landed at Ganzirri in Sicily, and Cannitello (Cannitella) on the main land, are not marked by lights.

Note.—Anchorage in the vicinity of the telegraph cables is prohibited.

(2.) *Sta. Agata and Pace.—Lights Discontinued.*—The lights formerly exhibited at Sta. Agata and at Pace, northward of Messina, are discontinued, the telegraph cables being no longer landed at those places.

159.—Black Sea.—*Búg River.—Sievers Point.—Alterations in Colour of Leading Lights.*—On the opening of navigation in Búg (Boug) river, the lower light, previously white, will be a *red* light; the upper light, previously red, will be a *white* light.

160.—Black Sea.—*Depth on Shoal in Kertch Strait.*—The shoal of 18 feet, in Kertch strait, lying south-eastward of Cape St. Paul (Pavloski) lighthouse, with the lighthouses of Churubash (Tchouroubaschski) and Kamysh (Kamysch-Boursunki) in line, has now a depth of 17 feet over it.

161.—Black Sea.—*Poti.—Alterations in Colour of Leading Lights.*—For crossing the bar of Rion river, the outer or seaward light, previously white, is a *red* light; the inner light, previously red, is a *white* light.

162.—Black Sea.—*Batoum—Alterations in Lights.*—Transferred to the new lighthouse in course of construction. The lights, *fixed white*, are placed vertically, and visible from a distance of eight miles; the upper light is elevated 51 feet above the sea.

163.—North Atlantic.—*Azores.—Fayal Island.—Horta Bay.—Light on Breakwater.*—A *fixed red* light is now exhibited 50 yards within the extremity of the breakwater in course of construction in Horta bay, S.E. coast of Fayal island. Position approximate, lat. 38° 31′ 45″ N., long. 28° 38′ 0″ W.

164.—Africa.—*East Coast.—Quilimane River Entrance.—Buoyage.*—The buoy marking the extremity of Tangalane banks, eastern side of Quilimane (Quillimane) river entrance, has been replaced. The buoy, cylindrical in shape, and painted black, is moored in 8 fathoms, on the south extreme of the bank. Southward of Militao bank, Quilimane river entrance, two buoys,

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cylindrical in shape and painted red, have been placed to indicate the channel.

Note.—Entering Quilimane river, the buoys painted black should be left on the starboard-hand; those painted red, on the port-hand.

165.—SOUTH INDIAN OCEAN.—*Seychelle Islands.—Light on Dennis Island.*—In March, 1882, a light would be exhibited from a lighthouse on the northern part of Dennis island, Seychelle group. It would be a *fixed white* light, elevated 82 feet above the sea, and visible from a distance of 15 miles. Position, approximate, lat. 3° 48′ S., long. 55° 40′ E.

166.—INDIA. — *West Coast.* — *Beypore.* — *Erection of Pillar marking Southern Boundary of Port.*—The southern boundary-pillar of the port of Beypore, situated about 1¼ mile S.S.E. ¼ E. from Beypore flagstaff, having been destroyed by the encroachment of the sea, a new pillar is to be erected 55 feet east, or inshore, of the old site, and 216 feet west of the local fund road.

167.—INDIA.—*West Coast.—North Cánara.—Sunken Danger about 3 miles Westward of Cape Modeshwur.*—This danger (*Dart rock*) is reported to consist of rock about a quarter of a cable in extent in a N.N.W. and S.S.E. direction, with a depth of about 10 feet over it at low water; it lies with the following bearings and distances:—Cape Modeshwur, E. by N., distant 3 miles; Jali Kund or Hog island, S.S.E., distant $5\frac{4}{10}$ths miles; Netrun or Pigeon island, S.W. by W., distant 7 miles. These bearings place Dart rock in lat. 14° 4′ 55″ N., long. 74° 25′ 10″ E. Depths of 7 to 8 fathoms, over mud, were obtained around the rock, with the exception of a shoal cast of 3½ fathoms rocky bottom, about one cable's length eastward of it.

Note.—Dart rock, unless the sea is breaking on it, is not discernible—caution therefore is necessary when navigating in the vicinity. *Variation*, 1° *E.*

168.—INDIA.—*West Coast.—Bombay Harbour Approaches.—Fishing Stakes.*—The whole area of the sea off the entrance to Bombay harbour, comprehended between south-west Prong and Khundári (Kenery) island lighthouses—bearing east respectively—is now clear of fishing stakes, and will be so maintained; but northward and southward of these limits there is no restric-

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tion as to the position in which fishing-stakes may be placed; consequently, the passage between the stakes, with south-west Prong lighthouse bearing N.N.E. ½ E., which formerly existed, should not now be used. Vessels approaching Bombay from the northward, should bring south-west Prong light to bear northward of east before altering course towards the harbour. Approaching from the southward, Khundári (Kenery) island light should be brought southward of east before steering for the Outer light-vessel. *Variation*, 1¼° *E.*

169.—India.—*Bay of Bengal.—River Hooghly Approaches.—Position of Pilot's Ridge Light-Vessel.*—The Pilot's ridge light-vessel has been placed in position for the approaching monsoon, and the light exhibited in accordance with established rule. The light-vessel has been placed about 3½ miles south of the position assigned to it on the latest charts, and now lies in lat. 20° 46′ N., long. 87° 39′ 30″ E. The Pilot's ridge buoy is moored 1½ mile north of the light-vessel.

170.—India.—*Bay of Bengal.—Chittagong Coast.—Entrance to the Chittagong or Kornafuli River.—Changes in the River Bar.*—Considerable changes are reported to have taken place in the bar at the entrance to the Chittagong or Kornafuli river. Mariners are cautioned not to attempt to enter the river without a pilot.

171.—South Australia.—*Spencer Gulf, Wallaroo Bay.—Light on New Jetty.*—A fixed *red* light is now exhibited from the end of the new jetty in Wallaroo bay. It is 23 ft. above high water mark, and visible at a distance of four miles.

172.—South America.—*Magellan Strait.—Broad Reach.—Sandy Point Road.—Buoy Marking Wreck not in Position.*—The wreck of H.M.S. *Doterel* lies in from 9 to 10 fathoms water, with the following mark and bearings:—The principal lighthouse just open westward of the small lighthouse, N.W. ¾ N.; Cemetery cross, W. ½ N; Sandy point, N. by E. The least water over the wreck is stated to be 6 fathoms. The wreck buoy has disappeared, and mariners are cautioned accordingly. *Variation*, 21½° *E.*

173.—West Indies.—*New Granada.—Light at Cartagena.*—Exhibited from a lighthouse situated on the tower of the disused

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Convent of La Merced at Cartagena; it is a *revolving white* light, with flashes *every fifteen seconds;* elevated 106 feet above the sea, and visible from a distance of about 20 miles. Position, lat. 10° 25′ 40″ N., long. 75° 33′ 45″ W. Approaching Cartagena from the northward, the light should not be brought southward of the bearing S.S.E. until past Canoas (Canoes) point. Approaching from the westward, the light should not be brought northward of E. ½ N., in order to pass northward of Salmedina bank. From the anchorage off Santo Domingo gate, Cartagena lighthouse bears E. by N. ½ N., distant about 2 miles. *Variation*, 4½° *E.*

174.—UNITED STATES.—*Gulf of Mexico.—Louisiana.—Lighthouse near Mouth of Amite River.*—On and after May 1, 1882, a *fixed white* light will be exhibited from the lighthouse recently erected in Lake Maurepas, near the mouth of the Amite river. The light consists of a lantern suspended from a pole, about 45 feet above the surface of the lake. It should be seen in clear weather from the draw of the railroad-bridge crossing Pass Manchac. The structure is a one-story frame dwelling, resting on four wooden piles. The dwelling is white; blinds green, piles brown.

175.—UNITED STATES. — *Gulf of Mexico.* — *Florida.* — *Cape San Blas Light not Constantly Exhibited.—New Auxiliary Light.*—Continued encroachments of the sea have so far endangered the safety of the lighthouse at Cape San Blas, Florida, that it is impracticable to exhibit the light when the sea is heavy. Therefore on or about April 5, 1882, a *fixed white* light would be exhibited from a pole 100 feet high, standing within 100 yards of the tower at Cape San Blas, at such times as it is impracticable to light the present light.

176.—UNITED STATES.—*Maryland.—Hooper Strait and Clay Island Lighthouses.—Rays of Red Light.*—The southern limits of the rays of *red* light intersect each other at Bishop's head buoy. Vessels entering Hooper's strait from Chesapeake bay, should keep in Hooper strait *white* light until they have crossed the *red* ray of Clay island lighthouse, thence keeping in Clay island *white* light till the *red* ray of Hooper strait lighthouse is passed. Shark Fin shoal can then be crossed in 9 feet water.

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177.—UNITED STATES.—*New Jersey.—Light-Vessel off N.E. end of Five-Fathom Bank.*—On or about June 1, 1882, a lightship will be moored off the coast of New Jersey, near the N.E. end of Five-Fathom bank, at the position now occupied by the whistling-buoy, in 9 fathoms of water. The vessel is schooner-rigged and painted red, with the words "North-East End" on each side in large black letters, and "No. 44" on the stern. A *fixed red* light will be shown from the foremast-head, at about 40 feet from the level of the sea, and a *fixed white* light from the mainmast-head, at about the same height. They should be visible about 11 miles. At each masthead will be displayed cage-work day-marks painted black and surmounted by black balls. Approximate position, lat. 38° 57′ 52″ N., long. 74° 32′ 21″ W.; with Hereford Inlet lighthouse bearing W.N.W. ½ W., distant 12 miles, and Five-Fathom bank lightship bearing S.S.W., distant 9⅞ths miles. Vessels of deep draught should pass to the seaward of this lightship. During thick and foggy weather there will be sounded on this vessel a 12-in. steam fog-whistle, giving every 2 minutes two blasts of 4 seconds' duration with 5 seconds' pause between, thus,—blast 4 sec., interval 5 sec.; blast 4 sec., interval 1 min. 47 secs.

178.—UNITED STATES.—*Maine.—Whistling Signal-Buoy off Boon Island.*—On on about May 1, 1882, a whistling signal-buoy will be moored near Boon island ledge, off Boon island, in place of the first-class nun buoy now there. This buoy is painted with red and black horizontal stripes, with "B. I. L." painted in white letters on the middle black band. It is surmounted by a whistle operated by the motion of the sea, and giving blasts at short intervals.

179.—NOVA SCOTIA.—*S.E. Coast.—Sable Island.—Destruction of Light on West End.*—Destroyed by the sea, and discontinued since February 12, 1882.

180.—GULF OF ST. LAWRENCE.—*Cape Breton Island.—Position of Cape North Lighthouse.*—The lighthouse on Cape North, the N.E. extremity of Cape Breton island, is situated on the eastern extremity of the cape, nearly one mile southward of Money point, in lat. 47° 1′ 35″ N., long. 60° 23′ 0″ W.

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OUR OFFICIAL LOG.

Official Inquiries at Home, 1882.

1286. *Evadne*, s.s.; built at South Stockton, 1869; owned by Mr. W. R. Garthorne; tonnage, 816; Hull to Reval; general cargo; lost on rocks N.W. of Hallands Waderö, Kattegat, Jan. 25, 1882. Inquiry held at Hull, March 16, 1882, before Twiss, Stipendiary Magistrate; Parfitt and Curling, N.A. Casualty due to vessel being carried in some unexplained manner some 14 miles to the eastward of her course. Master censured for not verifying his position when off Kobber Light.

1287. *Exhibition*, schooner; built at Sunderland, 1851; owned by Mr. H. Vane; tonnage, 110; Guernsey to Greenwich; stone. Stranded on the Maplin Sands, February 14, 1882. Inquiry held at Greenwich, March 14, 1882, before Balguy, Judge; Hight and Ronaldson, N.A. Master to blame for careless navigation in allowing his vessel to get to the northward of her course. Certificate suspended for three months.

1288. *Gavenwood*, schooner; built at Limekilns, Fife, 1875; owned by James G. Macduff; Middlesborough to Naples; pig iron and coke; stranded off Thorpeness, February 11, 1882. Inquiry held at Lowestoft, before Reeve and Edwards, Justices; Methven and Hyde, N.A. Mate to blame for carelessness and neglecting to keep a good look-out when the vessel was standing into the land. Certificate suspended for three months. Master censured for being below, and for leaving no specific instructions for the mate's guidance.

1293. *Maritime Union*, ship; built at St. John's, N.B., 1876; owned by Mr. J. Nevins; tonnage, 1,500; Hull to San Francisco; coals; burnt and abandoned at sea, October 11, 1881. Inquiry held at Hull, March 1, 1882, before Rothery, Wreck Commissioner; Forster and Wilson, N.A. Court found that fire was due to spontaneous combustion, caused by the coals having been taken on board in a wet and unscreened state. Master to blame for taking

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hatches off when the fire was discovered, and for not at any time taking steps to ascertain the temperature of the hold.

1294. *Gads Hill*, ship; built at St. John's, N.B., 1872; owned by Mr. G. T. Soley; tonnage, 950; Garston to Rangoon; coals; burnt and abandoned at sea, October 28, 1881. Inquiry held at Liverpool, March 18, 1882, before Raffles, Judge; Forster and Ward, N.A. Fire originated in coal cargo. Abandonment justifiable, the master having exhausted every means in his power to subdue the fire and save the ship.

1295. *Gannet*, s.s.; built at Whiteinch, 1878; owned by Mr. J. White; tonnage, 1,189; Calcutta to Leith; general cargo; lost near Seaford, February 14, 1882. Inquiry held at Westminster, March 13, 1882, before Rothery, Wreck Commissioner; Comyn and Kennedy, N.A. Master in default for steering improper courses and neglecting the lead. Certificate suspended for six months; recommended for one as mate.

1296. *Swiftsure*, barquentine, and *Aracan*, barque; the former built at King's Bridge, Devon, 1873; owned by Mr. H. Grant; Salcombe to Greenock; sugar; the latter a Swedish vessel, built in 1876; tonnage, 695; Troon to Demerara; coals; in collision 25 miles S.S.W. of South Bishop Light, February 24, 1882, when the *Swiftsure* foundered and loss of life ensued. Inquiry held at Swansea, March 17, 1882, before Fowler, Judge; Pickard, Harland and Anderson, N.A. Mate of *Swiftsure* to blame. His master's certificate suspended for six months. Those in charge of *Aracan* severely censured for not waiting to render assistance.

1301. *Bendigo*, s.s., and *Mary and Julia*, schooner. The former built at Barrow, 1877; owned by Mr. J. Hoult; tonnage, 924; Huelva to Liverpool; minerals. The latter built at Devoran, 1877; owned by Mr. J. Woolcock; tonnage, 148; Porthcawl to Lisbon. In collision at sea, December 21, 1881, when the *Mary and Julia* foundered and loss of life ensued. Inquiry held at Liverpool, March 20, 1882, before Raffles, Judge; Aplin, Curling and French, N.A. Casualty due to the schooner carrying no lights. Court found conduct of master of *Bendigo* reprehensible in not lowering a boat or making any endeavour to save life.

1303. *Woodville*, barque; built at Liverpool, 1876; owned by

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Mr. J. E. Nelson, who was also master; tonnage, 740; Liverpool to Otago; general cargo; stranded on Blackwater Bank, St. George's Channel, February 25, 1882, when loss of life ensued. Inquiry held at Liverpool, March 23, 1882, before Raffles, Judge; Hight, Grant and Kennedy, N.A. Casualty due to the vessel having stood into the Irish coast too long without using the lead. Master drowned.

1304. *Anchoria*, s.s.; built at Barrow, 1875; owned by the Barrow Steamship Company (Limited); tonnage, 2,713; Glasgow to New York; general cargo; in collision with a vessel unknown, September 20, 1881, when loss of life ensued. Inquiry held at Glasgow, March 22, 1882, before Hannan and Lammie, Justices; Powell, Beasley and Comyn, N.A. Prompt and proper measures taken to avoid collision. Neither master nor mate to blame.

1305. *I. H. M.*, three-masted schooner; built at Milford, 1877; owned by Mr. E. Roberts; tonnage, 193; New York to Viana (Portugal); petroleum; lost on Long Island, January 11, 1882. Inquiry held at Liverpool, May 24, 1882, before Raffles, Judge; Wilson and Methven, N.A. Master and mate both to blame for standing into the land too long. Certificates suspended for three months respectively.

1306. *Citizen*, brigantine; built at Nova Scotia, 1869; owned by Mr. M. Henry; tonnage, 197; left Barrow, February 7, 1882; iron ore; abandoned at sea, February 25, 1882. Inquiry held at Liverpool, March 27, 1882, before Raffles, Judge; Wilson and Methven, N.A. Abandonment justifiable, the vessel having lost her topmasts; she was subsequently towed into the Mersey, and surveyed, when she was pronounced seaworthy and not overladen.

1307. *Oscar*, s.s.; built at Dumbarton, 1853; owned by Mr. G. G. Mackay; tonnage, 215; Libau to Bruges; barley; stranded off Terschelling Light, January 17, 1882. Inquiry held at Falkirk, March 24, 1882, before Bell, Judge; Ward and Hyde, N.A. Master in default for neglecting the use of the lead, and for running in towards the land at full speed during hazy weather. Certificate suspended for six months, and recommended for one as mate.

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1309. *Bosphorus*, ship; built at St. John's, New Brunswick, 1855; owned by Mr. J. Hall and others; tonnage, 1,330; Genoa to Omz (Tripoli); iron ore as ballast; lost at Omz, January 17, 1882, when loss of life ensued. Inquiry held at North Shields, March 24, 1882, before Spencer and Baker, Justices; Pickard, Parfitt and Harland, N.A. Loss due to the parting of the port cable, and the dragging of the starboard anchor during a heavy gale blowing dead on shore. Master free from blame.

1312. *Antisana*, s.s.; built at Liverpool, 1880; owned by Mr. G. Bell, and others; tonnage, 1,097; Odessa to Limerick; barley; supposed to have foundered at sea. Inquiry held at Liverpool, April 3, 1882, before Raffles, Judge; Moresby and Castle, N.A. Probably foundered in the heavy gales prevailing off the coast of Ireland during month of November.

1313. *Alert*, s.s., and *Whitehead*, s.s.; the former owned by the Alert Steamship Company; tonnage, 889; Cardiff to Port Said; coals; the latter owned by the Ulster Steamship Company; tonnage, 744; Cardiff to Genoa; coals; in collision off Lavernock Point, Bristol Channel, March 16, 1882, when loss of life ensued and the *Alert* foundered. Inquiry held at Cardiff, March 31, 1882. Collision due to an error of judgment on the part of the master of the *Whitehead* in not anchoring in a dense fog. Certificate not dealt with.

1314. *St. James*, ship; built at Thomaston, Maine, U.S., 1856; owned by Mr. J. Herron and others; tonnage, 1,342; Valparaiso to Liverpool; guano; abandoned at sea, February 23 1882. Inquiry held at Liverpool, April 4, 1882, before Raffles, Judge; Kennedy and Parish, N.A. Abandonment justifiable, vessel having received material injury from the tempestuous weather encountered.

1315. *Rocklands*, ship; built at New Brunswick, 1878; owned by Mr. Z. Chipman; tonnage, 1,464; Cardiff to Rio Janeiro; railway iron and coals; abandoned 40 miles *south of* Smalls, March 2, 1882. Inquiry held at Liverpool, April 8, 1882; before Raffles, Judge; Vaux and Rees, N.A. Vessel having sprung a leak in consequence of the heavy weather encountered, master and crew fully justified in abandoning her.

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1316. *Mary Ann*, barge, and *Dafila*, s.s.; the former belonging to Faversham; owned by Smith, Dean and Co.; tonnage, 50; Milton to Vauxhall; bricks; the latter built at Sunderland, 1873; owned by Mr. J. Laing; tonnage, 552; London to the north; ballast; in collision off Broadness Point, River Thames, Feb. 19, 1882, when the barge was sunk and loss of life ensued. Inquiry held at Westminster, March 31, 1882, before Rothery, Wreck Commissioner; Aplin, Comyn and Ronaldson, N.A. Casualty due to the steamer rounding the point at too great a speed, for which the waterman in charge was responsible.

1317. *Atmosphere*, ship, and *Thyatira*, ship; the former built at Connecticut, 1856; owned by Mr. J. S. de Wolf; tonnage, 1,378; Liverpool to Valparaiso; coals. The latter built at Aberdeen, 1867; owned by Mr. W. Henderson; tonnage, 962; Melbourne to London; general cargo. In collision about 80 miles from Rio Janeiro, January 27, 1882, when the *Atmosphere* foundered and loss of life ensued. Inquiry held at Westminster, April 4, 1882, before Rothery, Wreck Commissioner; Hight, Grant and Ronaldson, N.A. Collision due to the helm of the *Thyatira* having been put hard down, throwing the ship up in the wind instead of continuing her course. Chief officer guilty of error of judgment. Certificate not dealt with.

1318. *Annie*, barque; built in Nova Scotia, 1864; owned by Mr. G. Browne and others; tonnage, 505; Troon to Matanzas; coals; lost near Nuevitas, Cuba, February 7, 1882. Inquiry held at Liverpool, April 5, 1882; before Raffles, Judge; Kennedy and French, N.A. Master and mate in default for steering a course dangerously near the land. Certificates suspended for three months respectively.

1320. *Roxellana*, ship; built at St. John's, N.B., 1877; owned by M. C. G. Turnbull; tonnage, 1,446; Hull to San Francisco; coals; abandoned at sea, November 23, 1881. Inquiry held at Hull, January 8, 1882, before Twiss, Judge; Curling and Murdoch, N.A. Abandonment somewhat premature; master to blame for taking chief officer with him in his boat leaving other boat in charge of boatswain. Severely censured.

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OFFICIAL INQUIRIES ABROAD, 1881-2.

1289. *Falcon*, barque; abandoned at sea. Naval Court held at Valparaiso, January 27, 1882. Abandonment premature. Master severely censured.

1290. *Cosmos*, barque; stranded on Stone House Shoals, off Tybee. Naval Court held at Savannah, February 27, 1882. Master censured for making no allowance for current.

1291. *Maude*, cutter; lost at Qara Qara, Fiji, October 23, 1881. Inquiry held at Levuka, Fiji, October 7, 1881. Master free from blame.

1292. *Alarm*, cutter; stranded in a cyclone at Nadi Viti Levu, December 11, 1879. Inquiy held at Levuka, February 20, 1880. Master blamed for abandoning the vessel.

1297. *James Gaddarn*, barque; stranded on Back Beach, Durban, January 27, 1882. Inquiry held at Durban, February 14, 1882. Casualty due to stress of weather. Master exonerated.

1298. *Albert Edward, Prince of Wales*, cutter; lost at East ondon, January 23, 1882. Inquiry held at East London, February 1, 1882. Loss due to man in charge being incompetent and unfit for his position.

1299. *Sokoto*, barque; stranded in Algoa Bay, November 25, 1881. Inquiry held at Port Elizabeth, December 21, 1881. Casualty due to defective chain cables. Master's certificate suspended for two months for not having spare anchor in readiness for use.

1300. *City of London*, s.s.; lost at the confluence of the Rivers Zwab and Shat al Arob, March 4, 1881. Naval Court held at Busreh, March 9, 1881. Loss due to error in judgment on part of master.

1302. *Ellen Stuart*, ship; burnt whilst taking in cargo at Calcutta. Inquiry held at Calcutta, February 3, 1882. No evidence as to cause of fire.

1308. *Julia Percy*, s.s., and *Nelson*, s.s.; in collision off Apollo Bay, Cape Otway, December, 25, 1881. Inquiry held at Melbourne, January 13, 1882. Master of *Nelson* to blame. Certificate suspended for six months.

1310. *W. J. Stairs*, barque; lost on Coast of New Jersey.

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March 1, 1882. Naval Court held at New York, March 6, 1882. Master guilty of error in judgment. Warned to be more careful when approaching land in thick weather.

1311. *Corsica*, barque ; lost near mouth of Columbia River, February 20, 1882. Naval Court held at Portland, Oregon, February 28, 1882. Master and pilot free from blame.

1319. *Wotonga*, s.s. ; lost at Tacking Point, Port Macquarie, January 2, 1882. Inquiry held at Sydney, January 28, 1882. Master in default for steering wrong course, and mate to blame for disobeying orders. Certificates suspended for three months respectively.

1321. *Silver Cloud*, barquentine, and *Chattanooga*, barque in collision in Newcastle Harbour, December 6, 1881. Inquiry held at Newcastle, January 5, 1882. Pilot to blame for not having his anchors in readiness for letting go. Suspended for twelve days.

GENERAL.

Minikoi Island.—The Hydrographic Office publishes the following information relating to Minikoi island, derived from a report made by Commander Edwards, of H.M.S. *Ready*, December, 1881 :—

Anchorage.—N.E. Monsoon.—Anchorage may be obtained about 3 cables off the barrier reef, on the west side of the island, to the southward of the only boat channel into the lagoon from the westward, but this anchorage is however foul and insecure. The best depth for anchoring in, is 10 fathoms, as the water shoals quickly from that depth to the reef, and deepens as rapidly outside 15 fathoms. H.M.S. *Ready* slipped off into deep water almost immediately after anchoring in 15 fathoms; but the anchor afterwards held when let go in 10 fathoms, during the whole of her stay (8 days), there being in the interval, occasional squalls off the island. When swung towards the reef, with 40 fathoms of cable out, there was not less than 5 fathoms under the stern. It was found necessary to keep the steam ready.

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S.W. Monsoon.—The anchorages on the north and east sides of the island are much more contracted than that on the western side, but they are the only places available during the S.W. monsoon.

Lagoon Entrance.—From a careful examination of the entrance to the lagoon it was found to be very narrow and intricate; patches of coral with as little as 7 feet, cropping up in all directions, the general depth being from 15 to 18 feet, sand, at low water spring tides. When inside the lagoon, a deeper and clearer channel will be found, about 2 cables off the shore, reaching to a point one mile southward of the village. A vessel drawing 12, or even 15 feet, might in fine weather, and taking the precaution with the assistance of a pilot to buoy the shoal heads, feel her way into perfect shelter; but Commander Edwards does not recommend any vessel drawing more than 6 feet to attempt to enter the lagoon, unless a prolonged stay is meditated.

Pilots are readily provided by the native governor for moderate payment. The island is in the district of the Collector, who resides at Calicut.

PERKES' PARALLEL RULER.—We draw the attention of our readers to a new form of Parallel Ruler with Protractor (of large dimensions) conveniently attached, devised by Mr. Victor Perkes, an officer in the Peninsular and Oriental Company's Service. It seems to be a handy instrument, and is well spoken of by those who have used it.

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ICELAND.

THE following information, derived from reports made by the commanding officer of the French cruiser *L'Actif* and published by the French Hydrographic Office, will be of interest to our yachting subscribers.

North-West Coast.—*Talkna Fiord.—Anchorage.*—There is an excellent anchorage at the head of the bay, sheltered by a point of yellow sand. Anchor at an equal distance from both shores of the fiord and from the sandspit.

North Coast.—*Skagestrand.—Anchorage.*—The Danish mail steamer anchors west of the meridian of point Spaakone. The roadstead is open, and the captain of the mail steamer states that it is necessary to be always prepared to go to sea. To make this anchorage the west coast of Skagen must be followed two or three miles until the anchorage is reached, as there are numerous banks middle of Skagestrands bugt.

North Coast.—*Sigle Fiord.—Anchorage.*—This anchorage is not a bad one according to opinion of the captain of the Danish mail steamer, which visits the port several times a year, and of others acquainted with the coast. *L'Actif* visited this port. The points enclose it completely and the bottom is as good as in the other fiords.

North Coast.—*Grimsey Island.—Anchorage.*—The anchorage off Grimsey, in the south part of the island, is not sheltered from the easterly swell, as might be supposed from the chart. To await the termination of an easterly gale, a vessel may anchor off the houses in the bay at Sandvig, in not less than eight fathoms.

East Coast.—*Vapna Fiord.—Anchorage.*—This anchorage is readily approached by a steamer through the south pass. Approach the coast when off the village of Vindfell, about five miles east of the warehouse; continue to skirt it within a mile until near Krosavig; the course should be changed to starboard when the warehouse bears N. 47° 30′ W. The long island of Skibsholm can only be made out at a short distance, though it is 50 or 60

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feet high. Pass at 160 to 220 yards south of the last breaker visible off the south point of the island, and anchor very soon after bringing the low islet of Frederik Skoer midway between the rocky point Ankerholm and the south point of Skibsholm. A vessel drawing less than 13 feet can readily moor about 100 yards south-east of Ankerholm. There are two buoys placed for mooring and warping the schooners of the trading establishment.

These anchorages may become dangerous in winter only. In spite of the breakers to the north-east the swell enters the port with northerly gales.

East Coast. — *Djupavog.* — *Anchorage.* — To approach this anchorage bring the flag-staff on the merchant's house in line with a pyramid of stones surmounted by a ball, erected on the hill in rear. Vessels can anchor on the range of the eastern extremity of the island and the eastern extremity of the outer reef off point Eidarhuk, the west point of the entrance or near the first range, according to the draught of water, keeping a little to the southward of the range line, S. by E. of two pyramids of stone in the eastern part of the harbour. Visiting this port to seek shelter from westerly gales a vessel should anchor well in shore, as the heavy puffs from the south may cause her to drag. *L'Actif* had to get under way and seek a better anchorage near the head of the fiord (Beru fiord), where the land is higher. At Djupavog it is low. At the inner anchorage it is difficult, as in the other land-locked fiords, to judge of the weather outside. *L'Actif* had to return to port twice, after leaving in a calm, because westerly gales were still prevailing outside. *Variation*, 33° 30′.

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THE

NAUTICAL MAGAZINE

FIFTY-FIRST YEAR.

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SHIPPING PROSPECTS IN CHINA.

WILL British supremacy in the Chinese seas be ever overshadowed? It does not seem likely, but, nevertheless, the evil may befall us any day, unless English shipowners are far more enterprising than they have been of late. Chinese, not European, rivalry is our one present fear, more especially with regard to the profitable coasting trade of China. Doubtless for many years, perhaps generations to come, we shall be in a position to hold our own against all competition for the direct trade between England and Shanghai. To mercantile England, the fact of a Chinese tea-ship having entered the Thames is a mere matter for jest, seriously as it is regarded in the East by Europeans and Celestials alike. Nor need we be greatly exercised over the contemplated establishment of a direct Chinese line between Shanghai and some Continental or British port. Enterprising as "Ah Sing" unquestionably is, we need not dread him as yet in the trans-oceanic trade. Our wealth distances all antagonism in that direction. Speed is an element to be considered in these days of steam and electricity, and to obtain speed, large and costly ships, far beyond the range of John Chinaman's present means, are required.

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The China Merchants' Steam Navigation Company, successful though the venture has hitherto proved, must become a far wealthier and more powerful corporation ere it can enter into really formidable competition with the Anglo-Chinese lines. So far it has only acquired two or three vessels sufficiently large to run the risks and dangers incident to ocean navigation, and these it employs chiefly in the trans-Pacific trade. Still each year marks a steady increase in the average tonnage of its fleet; and within a few years, at most, we shall doubtless find this native enterprise owning vessels of between two and three thousand tons, and running a regular line between Shanghai and London. Although such emulation may prove vexatious in some respects, it can scarcely affect the broad question of our commercial predominance in this particular traffic. It may lower the profits of shippers and shipowners, but it can never become a source of positive danger. A swarm of house flies are irritating enough in all conscience, but we scarcely reckon them among the foes to be dreaded: so with Chinese interference in our ocean-borne trade. Native labour being far cheaper than English, it stands to reason that the China Merchants' Company will be able to accept freights at a lower rate than British lines, and although its smaller steamers may occupy weeks longer upon the voyage, there are certain classes of goods constantly requiring to be forwarded for which quick transport is a secondary consideration. Moreover, there are plenty of persons willing to ship in anything and everything so long as freights are cheap. These combined influences should secure for the Chinese line when, if ever, it is started a fair amount of business both in China and England; and in breaking down this opposition, which we may be sure the established lines will do their utmost to accomplish, British shipowners may be compelled perforce to lower freights, and possibly work at a loss for a time.

Lightly as we may regard this threatened antagonism, we cannot equally afford to ignore the growing influence of China in the lucrative coasting trade between the several Treaty Ports. As everyone knows, the internal commerce of China is expanding apace, but unfortunately our share in its carriage has not risen

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commensurately. The once dreaded "stars and stripes" have been practically driven out of these seas, but what flag has reaped the advantage?—The Union Jack? Certainly not. China, not England, has gained. True, we may have not gone back, but our advance has been slow compared with the giant strides we ought to have taken when once the influence of America was crushed.

About one-half in value of the coasting trade now falls to our share. Ten years ago it was forty-five per cent., or not much less. America then accounted for nearly one-half, whereas she now figures for barely one-fiftieth part, and yet we are little better off than before. No European nation has in the least encroached upon our domain, while from some incomprehensible fatuity China has been permitted to entirely usurp the place formerly held by America. Instead of carrying nothing at all, she now carries between forty and forty-five per cent. of the entire commerce, and if present signs are any guide to the future she is quite likely to take the premier place before the world is many years older.

Before entering more minutely into this question it may be well to recount the astonishing history of the native enterprise alluded to above. Ten years ago the Chinese coasting trade was monopolised to all intents and purposes by native-owned junks and lorchas, and by European and American vessels; but in 1872, a new era dawned for the Eastern Colossus. A few enterprising natives joined together and founded the China Merchants' Steam Navigation Co. for the purpose of opposing England and America in the coasting trade. Two small steamers, the *Aden* of 507 tons, and the *Yungching* of 661 tons and 180 nominal horse-power, were first obtained. English shipowners laughed in their sleeves, while the speedy collapse of the bold adventure was confidently predicted on all hands. But time went on and the China Merchants' Steam Navigation Co. did not die as expected. From this unpretentious beginning it grew rapidly in importance. In the following year it owned five vessels of 2,777 tons aggregate, and yet the orders received on Chinese account far exceeded its powers of performance. Five more vessels were

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then added, raising the total tonnage to 5,405 tons. The next year (1874) witnessed a further increase to fourteen vessels and 8,647 tons after allowing for the return of the *Haiching*, a borrowed gunboat of 409 tons, and the loss of the *Fusing* (532), wrecked in one of the periodical storms so common in these seas. In 1876, the fleet was augmented to seventeen vessels and 11,553 tons; then, in 1877, at a bound, to thirty-one vessels and 22,259 tons; and in 1878 to thirty-four vessels and 23,847 tons. By this time, however, the talisman of good luck seems to have been mislaid, as the following year resulted in the loss of five of the Company's steamers, the *Aden* (507), the *Howsang* (795), and the *Kiangchang* (862), being wrecked, while the *Kiangyune*, of 768 tons, and the *Kiangwae*, of 1,123 tons, two steamers bought among others in 1877 from the Shanghai Steam Navigation Company when that much belauded undertaking came to grief, having to be broken up as worthless. These misfortunes reduced the Company's fleet to twenty-nine vessels and 19,792 tons, from which point we find it again ascending. During the year 1880, the *Meifoo*, a really splendid iron steamer of 1,284 tons burden, joined the line, while other changes effected about the same time resulted in leaving the number of vessels unaltered, but added considerably to their carrying power. At the present moment the Company employs about twenty screw and ten paddle steamers, several exceeding 1,000 tons register. Needless to say its influence is making itself severely felt among the English shipping houses established at Hong Kong and Shanghai. The extent to which this once ignored emulation is cutting into the province so long recognised as belonging to England and the United States will be best learnt from what follows. As stated earlier, it was not until 1873 that China entered fairly upon the roll with foreign-built shipping. Up to that epochal year the entire native commerce between port and port was either shipped in foreign-owned vessels, or in junks which, entering and clearing at the native custom-houses, escaped all effective record. Accordingly we have no proper account of China's share in this traffic prior to the date mentioned, but we do know that the trade conducted in foreign-built vessels was for some years quite insignificant. In 1872 it was less than three per cent.

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of the whole. Since then it has developed rapidly, as shown in the following table giving the percentage of total value carried in each of the six subsequent years—

Years ...	1874	1875	1876	1877	1878	1879	
Chinese ..	8·15	12·02	17·65	42·86	44·51	41·91	per cent.

In the same years the proportions falling to the share of England, America, and Germany were :—

Years ...	1874	1875	1876	1877	1878	1879	
British ...	40·25	46·39	40·65	45·71	45·26	50·19	per cent.
American ...	45·02	34·49	33·64	5·80	2·75	2·01	ditto
German ...	5·17	5·48	6·11	4·23	5·68	4·67	ditto

The first point to strike one's attention is the utter annihilation of the American element. From the pride of place our enterprising "cousins" have sunk into comparative insignificance as a mercantile power in the East. Is this the result of their boasted protection?—or will Americans excuse the ugly little fact by pleading, as they so often do, "the Suez Canal?"

From 1877 upwards China and Great Britain have pretty equally divided this profitable commerce, completely distancing all rivals. Three years ago the latter were again well ahead, but 1880 found the positions somewhat altered, China for the first time taking the lead. This position she is likely to permanently assume—the days of the junk being evidently numbered. "Each year," to quote the appropriate words of Mr. Acheson, the Statistical Secretary at Shanghai, "extends the feeling among the Chinese that foreign-built vessels possess immeasurable advantages over native, and as time wears on we may expect to see the antiquated junk pass out of use and become forgotten." This is undoubtedly within the truth, and with the accelerated introduction of telegraphy, telephony, and other modern appliances, the consummation of this prophecy must be greatly hastened. Business in the Flowery Land is being conducted daily upon more and more modernized principles. Celerity and despatch have come to be acknowledged as the chief *desiderata*. Compared with the slow going processes formerly

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in vogue among the Chinese, exchanges now take place with Ariel-like speed. In other words Chinese isolation is a thing of the past. Those stupendous barriers erected by prejudice, bigotry and a false religion, which stood unshaken for centuries, are being everywhere beaten down by the all-conquering power of progress. China, like the rest of the world, bows down before the inevitable,—finding it impossible to withstand the resistless march of civilisation. She is being rapidly Europeanized, and this revolution must constantly increase in intensity. Nature somewhat cruelly ordains that only those industries which possess strength and vitality in themselves shall endure, and the poor, feeble junk trade, inheriting neither of these attributes, is certainly doomed. Awaking to the fact, the Chinese have practically ceased constructing this class of vessel, and in another thirty years the very type itself may possibly be forgotten.

It is now time to say a few words about the shares taken by the various nations in the Foreign and General (coast and foreign combined) trades of China. In 1870 our flag accounted for 83·36 per cent. of the total value of imports and exports shipped to or from foreign countries. America came second with 8·31 per cent., France third with 3·53 per cent., and Germany fourth with 2·62 per cent.; while the remainder of the world, including China, contented itself with 2·08 per cent. A decade passes, and we find the British flag still paramount, but with 75·46 per cent. only; America with a wretched 1·59 per cent., Germany slightly improved with 3·47 per cent., while the increasing activity of France is shown by the figures 10·70 per cent. Japan meanwhile has risen to third place with 4·26 per cent; Russia and China coming fifth and sixth with 2·61 and 1·05 per cent. respectively. The sudden impetus imported to native shipping enterprise about this time is best exhibited in another comparison made between 1878 and 1879. In the former year only 11 Chinese vessels of 6,465 tons aggregate were employed in the foreign trade; whereas in 1879 the corresponding figures were 296 vessels and 107,395 tons. From that date China has been devoting growing attention to the trans-oceanic, especially the trans-Pacific, trade; and it is confidently expected that in

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another few years the famous dragon flag will be seen flying over ships in every important seaport in the world. One advantage which China derives from having her own Mercantile Marine is—that emigrants can now sail under their own flag to California and the Sandwich Islands and on board vessels where they are comparatively comfortable and well-cared for. Formerly American-owned ships monopolised this passenger traffic, but since the China Merchants' Company entered the field, one American line after another has had to be abandoned. Predicating the future from the past and present, a time may soon come when the once all-powerful stars and stripes flag will be a stranger rarely seen in these waters, unless, as seems but too likely, the construction of the Panama Canal should, in combination with other influences at work, bring about an entire revolution in favour of the mighty Union.

Perhaps the most interesting story of Chinese progress is afforded by a comparison of the total entries and clearances at all the Treaty Ports. Here they are :—

	No.	Tons.		No.	Tons.
1872 ...	nil.	nil.	1876 ...	2,133	1,336,656
1873 ...	344	176,017	1877 ...	5,104	3,908,034
1874 ...	899	444,771	1878 ...	5,168	4,256,678
1875 ...	1,557	811,344	1879 ...	4,860	4,206,771

This table includes only vessels of foreign type, sailing under the Chinese flag and owned by native houses. It omits all reference to the enormous trade carried on in junks, and which is registered at the native custom-houses, as well as to that conducted in Chinese-built vessels, but sailing under special licences issued by the Superintendents of Customs at Shanghai and Ningpo. Including this latter element, however, Chinese shipping accounted in the year 1879 for 6,932 vessels out of 21,409 and for 4,353,696 tons out of 13,927,221. In 1880 the total entries and clearances rose to 22,970 vessels and 15,874,352 tons, while the proportion falling to the lot of China was considerably larger. The year 1881 again marked a substantial increase under both headings as regards the gross trade; but on separately examining the returns of Chinese *foreign-built* shipping we observe

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another important augmentation in the tonnage employed, while in respect to the number of vessels entering and leaving there is a considerable deficiency to note. This, however, may be partly accounted for by natural causes, and is a more or less constantly developing feature of all commerce. Both Chinese and European shipowners are rapidly substituting steam for sails, and enlarging the carrying capacity of their steamers. In the past decade the latter have doubled in number, and nearly trebled in gross tonnage, while sailing vessels have declined considerably in number, and more so in average burden. Foochow affords a remarkable exemplification of this process. Between 1873 and 1880 sailers decreased from 53,249 to 22,432 tons, steamers rising from 105,787 to 217,228 tons. At every port the same phenomenon is observable, and when certain inconveniences now experienced with regard to the landing and storage of goods are smoothed away, the present gradual supercession of sailing vessels may be expected to culminate in their almost entire disappearance at many ports. Want of storage room has hitherto proved a serious drawback. Formerly charterers of sailing vessels stipulated for a number of "lay days," and this enabled them to dispose of their cargoes on board, and despatch inland without incurring extra expense for coolie and godown hire. Steamers naturally necessitate quicker despatch, and at Swatow, Wuhu, and other places the available godown accommodation, eked out as it is by storage in empty shops and private dwelling-houses, is still at times insufficient to meet the demand. However, ample godown room is now being provided everywhere, and when the buildings in present course of erection are completed, the supremacy of steam will assert itself more forcibly than ever.

One other point calls for remark. The commerce of China, especially that between the home ports, is expanding at an astonishing rate, and to meet the ever increasing demand for ship room more steamers are required. What is chiefly wanted are flat-bottomed steamers of moderate capacity, high speed, and excessively small draught; vessels which, while capable of standing a rough sea voyage, are at the same time able to navigate safely the shallow waters of the Chinese rivers. Many of the ships now

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in service are quite incapable of crossing the bar at the entrance of the river leading to Tientsin at certain times of the year; and the same remark applies equally to half a dozen other ports. As, however, both Chinese and foreign owners are betaking themselves to rectify this acknowledged deficiency, there is a prospect of good orders shortly reaching English shipbuilders.

F. N. NEWCOME.

THE ENGAGEMENT DIFFICULTY.

IF we may judge from the views expressed by the deputation of shipowners who waited upon the President of the Board of Trade a short time since, the Merchant Seamen (Payment of Wages and Rating) Act, 1880, is, in some respects, not working at all satisfactorily. The deputation attended on behalf of the Chamber of Shipping of the United Kingdom, and among its members were to be found some of the leading shipowners in the country. Their object was to point out that, so far from having effected any improvement in the relations between owners and seamen, the new Act has produced exactly the opposite effect, and that, under its influence, desertions and failures to join have increased to such an extent as to cause serious inconvenience in the shipping trade. According to Colonel Hill, during the last four months of 1880, 89 vessels were detained at Cardiff by men refusing to join, while in the same period in 1881, 141 vessels were delayed by the like cause. He also maintained that crimping had been greatly encouraged and increased by the alteration in the law. Mr. Norwood, too, contended that vessels are often rendered unseaworthy by the refusal of men to proceed and the consequent engagement of incompetent substitutes. As a partial remedy for the present state of affairs he suggested that Superintendents of Mercantile Marine offices should be empowered to deal with deserters, more especially at ports where the police magistrates hold their courts only at intervals. Mr. Norwood regards advances as unavoidable.

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In the course of his reply, Mr. Chamberlain, while allowing that a certain amount of inconvenience has resulted from the new system, pointed out that such a result must be regarded as inevitable. The alteration in the law with respect to the engagement of seamen had, in his opinion, become a social and political necessity, but the change could not possibly be carried into effect without causing a certain degree of temporary disturbance. Imprisonment for breaches of contract having been abolished in all other branches of employment, he thought the old system of dealing with seamen could no longer be defended. As regards advances, Mr. Chamberlain reminded the deputation that the advance note had been almost universally condemned, but at the same time he admitted that this phase of the question is surrounded with considerable difficulty. He could hold out no hope of any amendment in the law during the present session of Parliament, but hoped to effect some improvement by means of administrative changes. As an experiment, it is proposed to keep at some of the South Wales ports a register in which will be entered the names of applicants for employment, and it is intended that only those men who can produce satisfactory evidence of their good character shall have the privilege of appearing on this list. In this way it is hoped that masters will be relieved from the necessity of engaging hands from among the worthless loafers who usually hang around the pier head on the chance of being picked up in cases of emergency. A list of deserters is also to be kept at the Mercantile Marine Offices for the use of masters and owners. Mr. Chamberlain further stated that, under sec. 9 of the Payment of Wages Acts, the Board of Trade are about to provide for the issue of licences for seamen's lodging-houses, and that the persons by whom these establishments will be kept will be required to see on board any hands who may be engaged therefrom.

We shall look forward with considerable interest to the working of the measures the Board of Trade are about to adopt for the purpose of mitigating the inconvenience arising from recent changes in the Merchant Shipping Laws. The proposed register of applicants for employment is a piece of machinery which will easily be set in working order, but with regard to its practical

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utility there appears to us to be considerable room for doubt. In the first place the suggestion that only men of good character shall have their names recorded will probably not be productive of much benefit. The practice of granting certificates of discharge and character has hitherto not done much to assist masters in the selection of their crews. The reckless manner in which V. G. certificates are issued renders it only too easy for worthless hands to pass themselves off as good seamen; and even those who are so bad, or who are not so fortunate as to sail with a master whose ideas on this point are not unduly lax, can generally succeed in obtaining the necessary credentials for a trifling outlay and by making a temporary change in their names. But in addition to the difficulty that will be experienced in preventing men of bad character from making use of the register, there is a strong probability that masters will not trouble to avail themselves of its assistance. In most cases it is not until the ship is being warped out of dock that a master becomes really aware how many of his hands intend to break their agreements, and at a time like this there will be a great temptation to accept a chance offer on the spot rather than send to the Shipping Office to consult the official register of applicants. Moreover the office would often be closed when the register would be required.

The advantage to be gained from the proposed register of men who break their agreements will depend in a great measure on the vigilance of the Board of Trade officers. The primary difficulty connected with this scheme is the facility with which men can change their names and remove from port to port. It is clear, however, that if the staff at the Mercantile Marine Offices keep a close watch upon men who fail to join, they will be able to make it impossible for them to obtain engagements without a great deal of inconvenience. If the system were worked vigorously, and masters carefully warned against employing such characters, it is evident that men would soon begin to reflect on the possible consequences before they made up their minds to desert. Those who could not be easily identified, and who have little to lose by detection might still give some trouble by shifting the scene of their operations, but even these would be made to discover that the

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necessity of travelling to another port after refusing to join is not always convenient. Of course, to render this measure thoroughly effective, the co-operation of masters will be requisite, for if deserters are engaged in spite of warnings, the whole system must fall to the ground so far as its utility is concerned.

As to the value of the aid to be derived from the services of licensed lodging-house keepers in checking desertions, we must admit that we have some doubt. It is proposed that these persons shall be required to see that men engaged from their establishments actually join the ships for which they sign, but at present we are unable to see by what means this requirement will be enforced. They will have no legal control over men lodging with them, nor any power to convey them on board, and under these circumstances the task of estimating the degree of their responsibility in cases of failure to do this will be a somewhat delicate and difficult one. The loss of their licenses will be the only penalty with which the authorities will be able to threaten them for not doing their utmost to persuade men to join after signing articles, and to enforce this so as to produce the desired effect, and, at the same time, so as to cause no injustice, will not be an easy operation. It must be remembered that the keeper of a licensed house will be situated between the devil and the deep sea. On the one hand he must be careful to avoid infringing the bye-laws of the licensing authorities, and do his utmost to compel men to join; and on the other, if he hopes to make a living, he must take care not to give offence to his customers. And in the case of seamen who have money in their pocket, but who have signed articles for fresh voyages, his interests will be directly at war with his duty. At all events the assistance afforded by the keeper of a licensed house will certainly be much less effective than was the aid which was furnished under the old system by the boarding-house master who had just cashed a seaman's advance note. Whatever may have been the disadvantages of the method formerly in force, the boarding-house crimps saved masters and owners a vast deal of trouble in shipping their crews; in fact, as we have often pointed out, this was the one redeeming feature which served to gloss over the grave disadvantages and evils to

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which the advance-note system gave rise. Whether the persons who are now to be licensed will be able to give much assistance in getting men on board remains to be seen, but we must own that we are by no means sanguine as regards the probable advantage to be derived from their services in this direction.

The most serious defect which has manifested itself in consequence of the change in the law is to be found in the fact that the allotment note is being made to take the place of the advance note as a means for placing the seaman in the hands of the crimp. That men are more at the mercy of crimps under the present system than they were formerly is highly improbable. But although the assertion that crimping has positively increased since the abolition of the advance note must be accepted with a considerable grain of salt, it is at least certain that the evils which the alteration of the law was intended to abolish have to some extent merely developed themselves in a new direction. And after all, this is, perhaps, no more than might have been expected. The advocates of the old system may point to this fact as evidence that the seaman must have an advance, and that it is useless to attempt to wean him from his old habits, but it appears to us that such a conclusion is altogether unwarrantable. Widely-spread and deeply-rooted evils are not to be swept away by a change in the Statute Book, as if by a magician's wand. That seamen, as a class, are extremely improvident, and that they have become so accustomed to spend a portion of their wages before they have commenced work that they regard the advance as their natural right, is certain. And a conviction of this kind is not to be rooted out in a few months by a mere stroke of the pen. Yet, for all that, the law may be made to assist in the work of reform. It has helped to plunge Jack into the hole, and it may unquestionably be turned to account in getting him out again. Hitherto, in certain respects, it has been all in the crimp's favour. It allowed the seamen to be sent on shore penniless after a voyage, and then left him two or three days without a sixpence of his wages. And when he engaged again, it encouraged him to squander a portion of his pay before he went on board. These disadvantages were

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without a parallel in any other branch of employment; and if seamen, as a class, have suffered some moral disadvantage from their influence, the result is not to be wondered at. And the evils which have been gradually accumulating for a long period past will not be suddenly abolished. The work of reform will, perhaps, be slow, yet we feel convinced that it has been commenced in the right direction. It may be that changes of minor detail are still required, but the general principles of the present law are sound. And by means of administrative changes of the kind which the Board of Trade now have in view, it will, no doubt, be possible to mitigate the evils which have manifested themselves in connection with the alteration in the law, and, at the same time, to aid in the work of actual improvement. If the staff at the various Shipping Offices do their utmost to throw obstacles in the way of the engagement of men whom they know to be deserters, they will greatly assist in reducing the number of refusals to join. And if it should be found possible to establish an improved class of boarding-house under the new licensing system, a great deal will have been done towards extricating the seaman from the group of the harpies who yet continue to regard him as their natural and legitimate prey.

THE BUOYING OF CHANNELS.

IT is a perplexing element in the navigation of the channels adjacent to our coasts and leading to our great ports, that a general uniform system of employing buoys for marking out the channels is not in existence. At one port the mariner may find the buoys placed according to certain principles, while at another he may find them laid according to rules exactly the reverse.

The chief elements of distinction for buoys are form, size, and colour, but these distinctions may be supplemented by the addition of a shape (globe, diamond, triangle, &c.) at the top of a mast fixed in the head of the buoy, or by the fitment of a bell with swinging

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clappers. There is also a new kind of buoy recently brought into use known as the automatic whistling buoy, which was described in our volume for 1877, page 769.

Another point deserving of notice is that the nomenclature of the various forms of buoys is somewhat unsettled; their descriptive names are found to vary at different places; and a further cause of ambiguity is the introduction of new forms of buoys with the descriptive names of which mariners do not readily become familiar in the absence of any special description of their peculiar features. Possibly most of our readers have heard of nun, can, conical, convex, spiral, drum, cylinder, or spherical buoys, but few there are who could accurately state what constitute the characteristics of each. But in addition to variability of nomenclature, buoys of the same shape are employed to give the mariner exactly opposite indications at different places.

Again, the intimations conveyed by the colours of buoys vary at different places, and the nomenclature also is not always so definite as it might be. Red, black, green, or white as whole colours are of course plain enough, but with parti-coloured buoys a slight diversity of expression in referring to the disposition of the different colours, is apt to lead to some confusion. Buoys painted in alternate bands of red and white, or black and white, are sometimes described as painted in rings or belts, chequered buoys are occasionally referred to as being painted in squares, &c.

For many years efforts have been made to bring about uniformity as regards the use of buoys on our coasts. The Admiralty, Board of Trade and Trinity House agreed upon a system which has for a long time been acted upon as regards the buoys under their management and control, but there being no law to regulate the usage of other bodies, it has followed that some authorities prefer to adhere to their own methods, and the result is that different systems prevail at different places.

In view of the necessity of a general agreement on the subject the General Lighthouse Boards have initiated a conference of representatives of the various authorities concerned, which conference, under the presidency of Rear-Admiral H.R.H. the Duke of Edinburgh, Master of the Trinity House, has held an

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important sitting at the Trinity House and nominated a sub-committee to pursue the subject into all its details.

Representatives from the Admiralty, Board of Trade, Trinity House, the Commissioners of Irish and Scotch Lighthouses, the Authorities of the rivers Thames, Mersey, Tyne, Humber, and Tay attended the first meeting of the Conference.

From the foregoing remarks the probable scope of the enquiry may be gathered, but we do not think it desirable at present to enter upon any discussion of the details. We shall hope to review the whole subject when the result of the labours of the Conference is made known, which we do not anticipate will be for some months. Evidence is to be obtained from all quarters where it is likely that practical experience can assist the Conference, and there is no doubt that suggestions from master mariners will be gladly received and carefully considered by the Committee at the Trinity House.

We understand that in connection with this subject a proposal is on foot for giving distinctive characters to wreck buoys, so that the mariner may be informed on which side he should pass an obstruction, both in regard to wrecks at sea and in rivers.

It will be obvious to our readers that the enquiry is one of the highest importance to navigation, and we would venture to express the hope that the deliberations of the Committee may result not only in an uniform practice being adopted for our own shores, but that the most approved system may also be made international.

CARGO STEAMERS FROM A SEAMAN'S POINT OF VIEW.

THE S.S. "MUNCHAUSEN."

IN the account of her launch in the local journals this steamship is described as being 268 feet in length, by 33 feet beam, and 26 feet depth of hold. Her nominal horse-power is 150, registered 180. She is provided with all the latest improvements. Has four steam winches, steam windlass, and steam-steering gear, &c.; is schooner-rigged; the captain, six officers, and engineers are berthed under the bridge.

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Equipment.—The *Munchausen* is now receiving her stores and coal for the voyage to America and back to a port in the United Kingdom or Continent. She has just returned from her trial trip; and the correspondent of the local journal states that the engines worked smoothly, and that the rate of speed gave *every satisfaction.* Now the correspondent, or reporter of the local journal was not on deck ten minutes during the trial trip of the vessel in question. He remained in the little cabin of the steamer; obtained his notes, and all information from the manager of the yard; drank success to the shipbuilding industry of Muddleton; had a smoke, and as soon as the *Munchausen* returned to dock this member of the fourth estate went on shore. The trial trip of the *Munchausen* was conducted thus:—A pilot, who is always employed by the builders, is in charge of the steamer; the foreman of the engine-shop is in the engine-room. The engineer of the *Munchausen* is also there; he is appointed by the builders of the engines and boilers, and is known as a "*guarantee man.*" He will remain in the *Munchausen* for six months, during which time he is expected to keep *things right;* that is to say, he will conceal all he can, letting the master and owner of the vessel know as little as possible as to the actual condition of the machinery and boilers. He is, as I have said, employed by the builders of the engines and boilers, and is *their* servant. He is paid by the *owners;* but does not consider them his masters. Neither are they. He *is* civil to the master; gives him no information as to the engines; and, as a rule, keeps his eye on him. A few tons of the best coal have been put on board, good pressure of steam is kept, the *Munchausen* is in ballast, and, therefore, she is *nine-tenths out of water;* only the half of the propeller is immersed. Under these conditions any amount of revolutions is obtained from the engine. The foreman of the engine-shop and the engineer of the ship are taking diagrams with the indicator. The piston-speed under the conditions above-mentioned is very considerable; everything is regarded as satisfactory, and the *Munchausen* returns to harbour.

The master and chief mate, just arrived in hot haste from Newport, now join the *Munchausen.* The master inquires as to her rate of speed, steering, &c. No one can give him any information.

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The pilot has gone home, so has the foreman of the engine-shop. The engineer of the *Munchausen* is, or pretends to be, equally in the dark. He *can*, and *does* tell the master that 88 revolutions were obtained, and that the pitch of the screw is so much. The master remarks to him, "but the screw is half out of water!" "Not my business," replied the engineer.

One would think some trial would have been made to ascertain how the vessel steered, with the helm hard-a-port (against the engine), and with the helm hard-a-starboard, or with the engine. Also as to the time it would take to get sternway on the vessel from going full speed a-head, so as to give the master some idea of the vessel he is to command. Nothing of the kind. In reply to the inquiries of the master, he is told—"*no time, the boat is chartered.*"

Very well, here she lay, this noble specimen of modern naval architecture; she is receiving her coal and stores for the voyage, and will shortly receive a cargo of pig-iron for New York. The builder of this cargo steamer is also a "general provider." He has found time, notwithstanding his intense study of naval architecture, to emerge from an atmosphere of displacements, co-efficients, horse-power effective and indicated, &c., and actually gives a large amount of his valuable time to the consideration of such commonplace articles as crockery, logs (patent and otherwise), hawsers, lines, cheap electroplate, knives, forks, spoons, common lamps, sails, compasses, optical instruments, cabin calico (linen), and a whole host of cheap articles of equipment known to seamen as a "Baltic," or "specification outfit." That is, the builder has taken upon himself to say, and that in an imperative manner, what a steamer requires for each particular voyage. Your non-nautical readers would at once conclude that a builder who has to provide steamers going on voyages to any part of the world, must have a good knowledge of the requirements for each particular voyage, and each description of steamer. *Not a bit of it;* by a flash of genius found only in certain minds, our "modern general provider" makes all steamers and all voyages alike, so that it is quite immaterial whether the steamer is going to Cronstadt, Japan, or Iceland, she gets the same outfit.

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On the decks of the *Munchausen* are, as I have said, her stores for the voyage. Her master and mate are busy with pencil and printed specification in hand checking the various articles. Now and then a close observer would notice the mate calling the attention of the master to some articles of doubtful quality. The master with a grim smile and a shake of his experienced head looks at the article, throws it down and mutters "specification." The master and mate having checked the lot, those stores which have to pass the Board of Trade official are arranged so that he may examine them with the least possible delay. The side and mast-head lamps are placed in a conspicuous position for inspection. Shortly the Board of Trade official arrives; he glances sternly at the lamps, sees that hawsers and lines *are* hawsers and lines, complains that the side screens are by his measurement (with an ivory rule) $\frac{1}{32}$nd of an inch out of the exact position, looks at pumps and air pipes of ballast-tanks, smiles and bows to the manager of the yard, and, in utter ignorance of the existence of such a person as the master, departs to continue his inspection elsewhere. The stores are put away, the sails are being bent, the master observing to the mate that the sun's image looks remarkably clear through the lower topsail, to which the mate replies "specification."

Loading.—The steamship *Munchausen* is now loading her cargo of pig iron. So far the stevedore is doing the ship and her master justice, and he continues throughout this day to stow the "pig" to the satisfaction of Captain Rouse, her commander. Next day, about noon, the managing owner, watch in hand, is observed taking stock of the progress made as the iron is lowered down the hatchways. The managing owner is aware that the day after to-morrow is Sunday; on the early morning of that day he has determined the steamer shall go to sea. Keep a cargo steamer in port on Sunday! Never! Calling the master in a sharp insolent tone, he informs him that the *Munchausen must* go to sea on Sunday morning, "*no mistake, you know.*" The master, who dares not say he owns a soul, meekly replies, "Very good, sir." Now Captain Rouse, the commander of the *Munchausen*, has visited nearly every port of the navigable world, has served a five years'

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apprenticeship and has seen some twelve years' service as second and chief mate; he has been about eight years in command of cargo steamers. "Very good, sir," he is *compelled* to reply to this man, who in seven years has managed to scrape together sufficient capital *or co-partners to build* light structures provided with small propelling power, called steamships. This until very recently obscure individual does the *skipper business* when his vessels are in port. He loads these vessels as deep as he thinks fit, and trims them ditto. He considers it quite time enough for the captain to be captain when the pilot leaves the ship. He takes complete charge of the loading and despatch; yet it is extremely doubtful whether this man could, without the assistance of his chartering clerk, tell where the Cape of Good Hope is. Will it be believed?—This man is at this moment managing property of the value (? cost) of £200,000.

The managing owner calls the stevedore, "Look here, Slasher, this won't do, chuck the iron into her; drop that finger and thumb business, chuck it into her; she must go to sea on Sunday morning"! Slasher, of the firm of Slasher & Hook, stevedores, tug owners, and marine store dealers, and also co-owners in the *Munchausen*, does as he is told, and walking up to his ganger, he says in an undertone (for the managing owner is a religious man), "Conkey, sling the ——— stuff into her! She must go to sea Sunday morning." The managing owner looks fiercely at the master, saying, "If you want me I shall be at the office," and he then departs.

Saturday midnight finds the *Munchausen* loaded. On Monday the local journal records the fact that 2,200 tons of pig iron were taken and *stowed* in the *Munchausen*, Messrs. Slasher and Hook being the stevedores, in thirty-six hours and forty-seven minutes.

Adjustment of Compasses.—A cold, foggy Sunday morning finds the steamship *Munchausen* with steam up, waiting for tide, seamen and firemen; Captain Rouse is thoughtfully walking the bridge; his age may be thirty-nine, he looks fifty, and but for an ugly scar on the left cheek would be considered a handsome man. He is strongly-built, broad-chested, and having a slight stoop, looks, as I have said, much older than he is. His dark hair is thickly

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sprinkled with grey ; every line in his face and forehead, and every grey hair speaking volumes of bitter experience forced on him by the extraordinary behaviour of cargo steamers he has commanded.

Sailors and firemen now tumble on board ; all conspicuous for their scanty supply of clothing, and large consumption of drink. Slasher, of the firm of Slasher and Hook, is on board with ten stalwart lumpers to take the steamer *outside*. Two of Slasher's tugs are in attendance to keep the *Munchausen* straight ; to nurse her out of dock, and to prevent her smashing into the dock-heads, which she would surely do owing to her bad steering and worse helmsman, whom the mate reports as being unable to see "a hole in a forty-foot ladder." Away she goes. "Steady!" shouts the pilot. "Steady!" repeats the drunken helmsman, in reply to the second mate who is with him ; and the *Munchausen* staggers clear of the dock-head by the breadth of a hair. The dock-master remarks to Captain Rouse, "You have a strong list, Captain." Before Rouse could reply, Slasher, co-owner, calls out, "not the cargo, sir, lop-sided bunker does it." The latter portion of the pig-iron was "chucked" in while the *Munchausen* was aground, and as Rouse cannot tell whether it is the cargo, or the bunker that has given his ship the list, he makes no remark.

Arrived outside, the helm is put to starboard, engines slow a-head ; the adjuster takes bearings of an object on shore with the vessel's head on the cardinal points of the compass. It is a cold morning, and Rouse notices that the adjuster's attention is about equally divided between the compasses and *his nose*. The engine is stopped, vessel headed seawards, and adjuster slips into chart-house, shortly returning with a deviation card which he hands to the master as *per specification*. All shore hands scramble into the tug. Rouse puts the telegraph full speed a-head, the voyage commences ; the course is given, and the *Munchausen* is off north about for New York.

If the reader had been in the Muddleton Dock, he would have seen a tall, powerful man standing on a stack of pit props, watching the departure of the steamship *Munchausen*. This individual looked like a well to do horse-dealer, or butcher. This

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was Mr. Grip, the managing owner of the firm of Grip, Sons, and Co., steamship owners and ship-brokers. This firm holds $\frac{1}{64}$ in each steamer; and the vessel whose departure he has just witnessed is their eighth steamer, and the two hundred and seventy-fourth on the books of the builder. The local journal always mentions Mr. Grip as Daniel Grip, Esq., J.P. To his *employés* he is known as "*Dan, the nipper.*" Messrs. Grip, Sons, and Co. are credited by report with making 5 per cent. on the capital invested by their co-partners in the steamers built at their port for them.

Passage.—After the pilot and the other persons had left the steamer, she steamed northwards at eight knots an hour; this was very soon reduced to six for the boiler primes considerably, and the firemen are all more or less affected by the drink they had taken the previous night and that morning. Everything on board is new and stiff, cheap and nasty. In due course the *Munchausen* arrives at the entrance to the Pentland Firth; the weather is fine, the water smooth. Firemen cannot keep steam. Seamen ill from the effects of drink. The steamer is out of trim, and has a strong list. She steers very wild, but after a good deal of fiddling, and considerable anxiety to the master, she clears the Narrows. An hour afterwards the framework of steering-gear carries away. The iron sheave forming the "lead" for the port wheel-chain has given way, bringing with it a large piece of the casting, evidently too light for the work required. However, the master and engineer, with some assistance, and wooden shores, *fix it up* after four hours work. The only recommendation to be found in this steering-gear was cheapness.

Three days after passing Rockal the weather looked dirty, the barometer fell, a thick rain with increasing swell from the S.W. warned Captain Rouse to prepare for an Atlantic gale of the usual winter type. Fore-and-aft canvas is reefed. Relieving tackles with endless fall are hooked on to rudder quadrant to assist wheel-chains, and to secure the rudder in the event of accident. Everything on deck is secured as well as possible, and extra guys are put on the funnel. Carpenter and boatswain are ordered to keep watch so as to give an additional hand to

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each officer when in charge of the deck. The gale increases, the sea makes, and the *Munchausen* commences her capers.

Over the bows, over the stern, and in both sides tumble the "green seas," and although bowing the sea she rolls frightfully, lashing the water from side to side, *rail high*. The bridge is the only spot in the ship where up to this time heavy water is not shipped. This bridge, or bridge space, extends from side to side of the vessel, *excepting the space occupied by engine-room skylights;* these are exposed. Beneath this bridge, and grouped round the engine and boilers are the berths for the master, officers, and engineers. During heavy weather this space is closed up, and being poorly ventilated is very hot, dusty and disagreeable, and has earned for itself the name of *Hell's Allotment*. After blowing for twelve or fourteen hours from the S.W., the wind flew into the N.W., causing a nasty cross sea. The *Munchausen* carried away the wheel-chains of Muddleton iron, and fell off into the trough of the sea before the damage could be repaired. She shipped sea after sea, washing away two boats and the after-wheel. While endeavouring to repair the damaged wheel-chains, the second mate was washed overboard, and one fireman and the carpenter very severely injured. Chain-peak and throat halliards came down by the run; boom sheet block straps carried away; all these were made of Muddleton iron.

Eventually the wheel-chains were repaired with connecting links, and Captain Rouse had to plaister and bandage the injured men. He could not find any Friar's balsam; the supply of bandages was lamentably short; in fact, notwithstanding that the medicine chest was supplied according to the Act, and included in the specification of the "general provider," it was, as Rouse termed it, a *dreadful sell*. One circular tin canister, capable of containing two pounds of simple ointment, had only a small quantity, certainly not larger than a walnut. The thirteenth day out finds the steamship *Munchausen* to the eastward of the Banks, making but slow progress. Two and a half to three knots an hour was the speed kept up for days. White Star and Cunard Liners came up with and passed the "noble specimen," driving

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first her bows and then her stern under water. Decks were continually flooded, notwithstanding that her storm ports ran out the water "full bore." She rolled dreadfully, making it nearly impossible to do anything but hold on. Cooking had been given up, the crew living on cold preserved food. The twentieth day finds the *Munchausen* a little to the eastward of the meridian of Halifax. Here she encountered another gale from S.W., with the usual heavy sea. In this gale the pig-iron, that had been "chucked" in, shifted, giving the ship a dangerous list. It took all available hands sixteen hours to trim the ship upright. By this time the gale had shifted to N.W., with heavier sea; again the iron that had been reduced to "scrap" by the "chucking" business, shifted. The spare propeller, that was lashed in the after 'tween-decks, broke adrift. The ring-bolts made of Muddleton iron had broken short off by the deck, and the propeller hopped about the 'tween-decks, charging into a cask of engine-room oil, which helped it in its mad capers. One butt started, and several of the ship's frames were broken; finally, it skipped down No. 4 hatchway, minus two blades, where it rested on the Muddleton pig-iron.

On the thirty-second day, Captain Rouse was boarded by a Hook pilot, south of Nantucket Shoals. Next day the *Munchausen*, after parting two of the warps, supplied as *per specification*, moored at a wharf at Brooklyn, *thirty-three days* from Muddleton.

Discharging.—The *Munchausen* was consigned to Messrs. Simper and Fluke, the agents of Messrs. Grip and Sons of Muddleton; Mr. Simper was an Englishman, his birth place Muddleton. Mr. Simper asked Captain Rouse *where* he had been with the steamer. "Your cargo," he said, "has been ready for you for the last thirteen days. However," continued Mr. Simper, "*I* have instructed our stevedore to tear that pig-iron out as soon as possible; night and day, you know, captain, no stoppage!" Mr. Simper then introduced to Captain Rouse vendors of grain bags, a butcher, a ship chandler, a tug-owner, a coal merchant, a bin carpenter, a laundress—and her husband, a night-watchman. "Anything you want, captain, you *must* obtain from these people; *I* know them; it will relieve you of considerable responsibility, and as our firm owns $\frac{1}{64}$ in the

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Munchausen, I take this upon myself." While Captain Rouse was on shore, the stevedore made his appearance on the wharf, and addressing the chief mate of the *Munchausen*, said, "Say, Mr. mate, get them derricks up right off!" "Sir?" replied the mate. "Get them derricks up right off, and tell the donkeyman to have plenty of steam, my crowd will be here after dinner; I want this pig out slick, I guess." "May I ask who you are, sir?" mildly remarked the mate. "I guess you may," replied the stevedore; "I am this Yank's stevedore, and I own $\frac{3}{8}$'$_4$ in this 'dug out!'" "Oh! very good, *sir*," said the mate.

The pig-iron is *torn* out; hold and 'tween-deck stanchions are bent and knocked out of their places; hatch-combings are banged out of the plumb; and shifting-boards, already in a sad condition from the shifting of the cargo, are still more knocked about. The steamer is towed under the elevator, the grain is teamed in, and bags are filled (?) and sewn up with three stitches, and *they* are "chucked" into their places. Carpenters are busy fitting up cattle-pens forward of the bridge. The fifth day from arrival the *Munchausen* is on her way to the Hook, bound to the Thames with the cattle, and to the North of England with the grain. Rouse had been instructed by cable *not* to replace his boats until his return. It was useless for the master of the *Munchausen* to remonstrate with agents or stevedore about the loading, they are co-owners, they *must* have the ship's interests at heart; besides, one word from the agents, Messrs. Simper and Fluke, would have taken effect with the managing owners, and Rouse on arrival home would be dismissed from his command.

Homewards.—Shortly after passing the "Hook," our Muddleton steamer met one of the steamers known as Liners; she looked very trim and clean, and had suffered no damage on the passage. "Fine vessel," remarked the chief mate to Captain Rouse; "Yes," he replied, "that ship takes her commander along, *I have* to take this brute along." Seven days after leaving Sandy Hook, heavy weather was again encountered, and our "noble specimen" renewed her bad behaviour. With fully double her registered tonnage of grain, and seventy head of cattle, and three hundred tons of coal, the *Munchausen* was well down in the water. She was tender

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(crank), extremely so. Her decks were continually flooded; she rolled heavily; the cattle were in many cases exhausted, and lying down in the pens. The litter prevented the water running out of the ports and scuppers; thus many poor brutes were drowned from sheer inability to get on their feet. Others were so chafed and knocked about that gangrene had set in. Others had lost horns and hoofs in endeavouring to extricate themselves when jammed amongst the now damaged cattle fittings. All these poor brutes were more or less frost-bitten. The tenth day out brings heavier weather and more misfortune. The boiler tubes leak, faces of high and low pressure slide valves grind down, and the vacuum is all wrong. The vessel makes but six and a-half knots in a fast following sea. She steers most dreadfully, and eventually broaches-to, blowing away foresail and lower topsail. As she came to, half of the foresail blew aft, unshipping the pole compass. One sea knocked the cattle-pens into matchwood; washing numbers of beasts overboard; those poor brutes that had strength swam close to the vessel, striking her with their fore feet in their endeavours to get on board. The rest of the cattle were now down to leeward, dead and dying, giving the steamer a very strong list. The same sea had stove in the bridge bulkheads, washing everything out at the after end. *Hell's Allotment* was gutted of everything but the bare iron sides of the vessel. Stores of food, charts, and the effects of the master, mates, engineers and steward, all had been washed overboard. Fortunately, the engineers were living in the engine-room, only coming from below for their food. The bulkheads of this bridge were fastened to the wooden deck, instead of being secured to an iron plate before the deck was laid.

The condition of the ship was now very critical. The boats that remained were got ready for lowering. Captain Rouse had some time previously ordered a few tins of preserved provisions to be placed in the two boats. After midnight the weather showed signs of moderating. Still the ship took more list. At daylight one boat was lowered, weather having moderated very considerably; shortly afterwards the second boat was lowered and passed astern. The weather had fined down too suddenly to last long, and Captain

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Rouse almost regretted having lowered his boats. With a long drift of painter they towed on each quarter, ship going dead slow, end on to the sea. But an increasing list warned him that there was no choice; there was nothing but the boats for it. By 11 a.m., all hands were in the boats; the master and chief engineer being the last to leave the now doomed steamer. As Rouse pulled aft, a smile forced itself about his lips as he read on the vessel's stern the owner's motto, *Omnia Paratus*. About half-an-hour after the crew had left the *Munchausen*, she turned bottom up and disappeared, forty-nine days after sailing from Muddleton. The boats containing the crew leaked very much, and no wonder—built of unseasoned wood and with fastenings *four inches apart*. By God's mercy, these poor fellows were, after some difficulty, picked up by a Norwegian barque that evening.

Next day the gale blew with renewed violence, but the barque (late a Blackwall Australian Liner) bowled away at the rate of two hundred and eighty-eight miles a day *without* shifting her grain. "What do you think of her going, captain?" said the Norwegian captain to Rouse. "Shape, shape does it." A few days afterwards Rouse and his men were landed at Falmouth.

After *four months* an enquiry was held. The master's certificate was suspended for six months, the mate's for three months, *for not giving their personal supervision to the stowing of the cargo*.

Grip, Sons and Co. heard the decision, and bore it like men. Simper and Fluke, of New York, heard ditto, and bore it ditto. The next voyage Rouse made he was drowned with all hands.

Grip and Sons built another steamer on the same lines, but about 160 tons larger. Iron had fallen, building was not so brisk, so she did not cost as much as the *Munchausen* by £1,600.

Curiosities of the s.s. Munchausen's career.—The *Munchausen* was to be paid for in six instalments extending over fifteen months. At the time of her loss one instalment had been paid; the second was not due. Ship *and freight* were of course insured. The owners or shareholders of this steamer received a dividend of 18 per cent. per annum on a capital *not paid up*, that is to say, they obtained a dividend earned in a *ship not paid for*, and on a cargo *not delivered*. And, as the ship to replace the *Munchausen*

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was to cost £1,600 less, the owners or shareholders were entitled to a *bonus* of £25 per $\frac{1}{64}$th. The officers and crew lost everything but what they stood upright in. The builders received the order to build another steamer before the *Munchausen* was paid for.

I take this opportunity of thanking those gentlemen, shipbuilders and shipowners, who have sent through the office of the *Nautical Magazine* their expressions of approval of my article in the April number; and while admitting the truth of their remarks *re* Lloyd's rules, I must state that I cannot further elucidate my views on the shape of cargo steamers without considerable risk of being boycotted.

TWENTY YEARS IN STEAMSHIPS.

THE SHIPWRIGHTS' EXHIBITION.

DURING the last month there has been held at the Fishmongers' Hall, London, an International Exhibition of ship models, promoted by the ancient Guild of the Shipwrights' Company of which the Right Hon. Lord John Manners, G.C.B., M.P., is the present master. Among the members of this Guild are shipwrights of all grades from the most eminent naval architects, shipbuilders and shipowners, to those more humble craftsmen who still follow shipwrighting as a working trade. The ancient Company of Free Shipwrights existed by prescription at a very early date. It had its origin in a Fraternity or Fellowship which was connected with a religious society dedicated to St. Simon and St. Jude, the earliest existing Ordinances being dated 1456 and 1483. It is, we believe, one of the least wealthy of the City Guilds, but of late years has brought itself more to the front, particularly by organising a competitive exhibition of naval models in 1877, and again by an International Competitive Exhibition of the same kind this year which was opened on the 2nd of last month by H.R.H. the Duke of Edinburgh, and remained open till the 14th.

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It is possible that, to an extent, exhibitions of this kind may encourage naval architects to vie with each other in the excellence and adaptability of their designs, but on the whole we are rather inclined to doubt their real practical usefulness, unless in all cases really practical and scientific men are appointed judges.

However as a collection of models the exhibition just held was extremely interesting, as showing the extensive strides that have been made in the science of naval architecture and in steam navigation during only the last fifty years.

One of the greatest curiosities of the exhibition was a model of what is known as the "Viking's Ship" supposed to be 1,000 years old, and discovered on the sea-shore of Scandinavia in 1880, a full description of which was given by Mr. Colin Archer at the meetings of the Institution of Naval Architects in 1881.

Hardly less interesting was a model of the *Royal Sovereign*, called also the *Sovereign of the Seas*, which was built at Woolwich in 1635 by Mr. Peter Pelt, son of Mr. Phineas Pelt, M.A., of Magdalen College, Cambridge, who built several vessels for His Majesty King James I., and whose family were Chief Constructors of the Navy from James I. to William III. She was larger than any ship previously launched, and designed only for splendour and magnificence, but afterwards being cut down, made one of the best men of war of her time, and figured prominently in almost all the great naval engagements between England and Holland. Interesting, too, was a rigged model of the immortal *Victory*, 100 guns, launched in 1765, and the flag-ship of Lord Nelson at the battle of Trafalgar. As specimens of men-of-war of later date the Lords Commissioners of the Admiralty also exhibited models of H.M.S. *Monarch*, completed in 1869; and H.M.S. *Devastation*, completed in 1873.

The French Ministry of Marine also sent four fine specimens of French ironclads, the *Admiral Duperré*, *Dévastation*, *Redoubtable* and *Tempête*. The *Admiral Duperré* is the most powerful broadside ironclad afloat, and the *Tempête* is a powerful coast defence monitor.

In the steam and sailing ship sections the finest vessels of the Inman, Cunard, Guion, White Star, Orient, Allan, Peninsular and

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Oriental, Donald Currie, and other lines were on view; the *City of Rome*, *Servia*, and *Alaska*, with their 10,000 and 11,000 indicated horse power, being enough to make one reflect with astonishment on the astounding strides made in steam navigation during the last half century, when it is remembered that fifty years ago such a thing as an ocean going steamer had never been seen, and scarcely talked of.

The last-named vessel, the *Alaska*, has lately succeeded in covering the distance from New York to Queenstown in seven days and twenty-six minutes, being the fastest run yet recorded.

The *Servia*, 8,500 tons, just named, is constructed entirely of steel, and there is every reason to believe that as wood was superseded by iron in shipbuilding, so ultimately steel will altogether supersede iron. In the exhibition of which we are writing, Messrs. Ismay, Imrie & Co., of Liverpool, showed a full model of the *Garfield*, 2,290 net register tonnage, lately built by Messrs. Harland & Wolff, of Belfast, being the largest sailing ship yet constructed of steel.

Perhaps one of the most interesting sections in the exhibition was that of the yachts, a class in which there is always great competition, and a class in which admiration and the severest criticism is much called forth.

Earle's Shipbuilding Company, Limited, Hull, showed models of the *Czarevna* iron screw yacht of 717 tons, built for H.I.H. the Czarewitch of Russia, and of the *Francesca* screw steam yacht of 315 tons, built on the composite system for His Grace the Duke of Marlborough, both designed by Sir Edward J. Reed, K.C.B., M.P., &c.; and the Barrow Shipbuilding Company, Limited, exhibited model of s.s. yacht *Aries*, 185 tons, built for Sir James Ramsden, of Burrow-in-Furness.

Mr. G. L. Watson, of Glasgow, evidently bent on captivating the eye, sent two handsomely-finished models complete in every detail, both being the finest specimens of yacht modelling that we have ever seen. His schooner model of 113 tons (judged as a model) was a handsome vessel; but of the two, we admired most the lines of the splendid steam yacht of 715 tons, designed by him for N. B. Stewart, Esq., of Torquay.

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Mr. J. E. Wilkins, M.I.N.A., of Wivenhoe, showed a half model of a very handsome schooner yacht of 160 tons, and a no less handsome cutter or yawl of 100 tons, both of cruising dimensions. A vessel built from either design would be the *beau idéal* of a pleasure yacht, and by no means lacking in point of speed. The dimensions of his racing "twenty" were immense, but though of peculiar form she appeared to be a perfect model.

Mr. W. E. Paton, of the Royal Naval College, Greenwich, showed models of a schooner yacht of 150 tons, and a racing cutter yacht of 40 tons, Y.R.A. The draft of water of his schooner (14 feet) we considered quite the maximum of draft for a cruiser, and with less rake to sternpost she might have been better.

The Marquis of Ailsa showed a nice-looking model of a racing "forty" of modern racing dimensions, and a half model of his new 3-tonner *Snarley Yow*, designed by W. Baden-Powell, Esq.

A vessel of very extreme dimensions (95 × 15·4 × 14·5) was that of a 90-ton racing cutter, exhibited by Mr. Arthur E. Payne, of Southampton, which would certainly have been better if shorter and broader.

Messrs. White & Son, of West Cowes, sent in the half model of a cutter yacht, which was awarded first prize in 1877, also model of a 200-ton schooner yacht, an excellent model of bold design and good dimensions. The model of a schooner-rigged auxiliary steam yacht we thought particularly good.

Mr. Beavor Webb showed a small model of the celebrated racing *Freda*, which was however rather too small to show off to advantage. The model of a steam yacht, 150 feet long, by the same exhibitor, seemed hardly a practical design, having rather too much "odds," and fore-foot cut away a little too much perhaps.

Mr. Harold E. Ratsey, son of Mr. Michael Ratsey, of Cowes, exhibited a wholesome looking model of a 243-ton schooner, and model of a 90-ton racing cutter.

Among the yacht models too was one exhibited by Mr. R. O. Hürem, Stavanger, Norway, after a drawing by His Majesty King Oscar, illustrating His Majesty's idea of the largest fast-going pleasure yacht or torpedo boat.

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One of the curiosities of the exhibition too was a model wrought in solid sterling silver of a fully-rigged sloop yacht getting under way. This piece of workmanship is stated to be made up of 875 separate pieces, and employed the leisure hours of an operative for seven years. It was shown by Mr. A. D. Lewis, Warden of the Shipwrights' Company and Honorary Secretary of the Exhibition.

THE INSTITUTION OF NAVAL ARCHITECTS.

(PAPERS *continued from p.* 336.)

ON THE BASIS FOR FIXING SUITABLE LOAD-LINES FOR MERCANTILE STEAMERS AND SAILING VESSELS, BY MR. B. MARTELL, CHIEF SURVEYOR TO LLOYD'S REGISTRY.

After remarking upon the importance of the interests involved in the question, Mr. Martell referred to his tables of eight years ago, and stated that those tables having been quoted in a way that was not intended by their compiler, Lloyd's Committee have recently taken the whole subject into their consideration. Amended tables have been prepared, they are not yet decisively sanctioned, but it is hoped they may be published in the Transactions of the Institution as an appendix to the paper. The principle of allowing a percentage of the total volume as spare buoyancy, the proportion depending upon the vessel's size, length, &c., is the basis of the new as of the former tables, the moulded depth is now however used instead of the depth of hold, and the length inside the vessel is substituted for the descriptive length as given in the vessel's register. The Government have recently issued a freeboard table, in which the freeboard of steamers is obtained by allowing so many inches per foot depth of hold, the rate varying as the length of the ship varies. The Government having legal power to detain overladen vessels, the Committee of Lloyd's have just provided a column for freeboard (to be inserted when desired by the owner). How do the two systems compare? To show the defects of a rule by which the freeboard is determined by a rate on the depth of hold, Mr. Martell takes a somewhat narrow sailing

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vessel of 1,000 tons which, by the Board of Trade rule, would be required to have a freeboard of 2·7 in. to the foot depth of hold which, in her case, would give an actual freeboard of 4 ft. 11¼ in. If the form of this vessel be improved by giving her more beam and more rise of floor, increasing the tonnage to 1,200, the freeboard would, by the rule, have to be increased to 5 ft. 1¼ in. On the other hand, if both these vessels were so laden as to have the same percentage of spare buoyancy, the larger vessel would have 4 in. less freeboard than the smaller. By this comparison he shows a loss in carrying power in the better formed and safer vessel of about 100 tons, and the reason assigned for this on the official tables appears to be that such vessels with "great rise of floor are more uneasy in a seaway." This reason will create amazement in the minds of owners and captains of these fine vessels. Mr. Martell substantiates his argument on this part of the question by comparisons based upon actual vessels, and then goes on to the case of steamers, remarking upon the diversities of construction as regards the spar or awning-decks or superstructures, and the consequent difficulties of fairly fixing their relative freeboards.

In vessels having a poop 7 ft. high connected to a bridge-house, and together covering half the length of the ship, the Government rule allows, in consideration of the superstructure, a reduction of 4 in. in the freeboard; in the case of a raised quarter-deck—forming an integral part of the vessel—connected with a bridge-house and altogether half the length of the ship, a reduction of only 3 in. is allowed. The utter inadequacy of this allowance is apparent when it is considered that the weight of these superstructures would, in some instances, cause the vessel to displace nearly, or quite the amount of the allowance. Such superstructures as those described, are found not only to add greatly to the surplus buoyancy, but also to conduce very much to the vessel's safety, by increasing the range of stability when she is heeled over from the cargo shifting, or from other causes. The liability of small flush-decked cargo steamers to great peril in encountering heavy gales at sea, from the certainty of the deck being inundated, is so clearly recognised by

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steam shipowners of experience, that such vessels are very rarely built for cargo-carrying purposes for over-sea voyages, but, as a rule, are protected by substantial superstructures extending over varying lengths of the upper-deck, and instead of owners being discouraged from incurring the extra expense, it is thought that every encouragement should be held out by allowing a much fairer reduction for the additional safety provided. The better way of making an allowance for superstructures would be first to determine the allowance due to an awning-deck, and then apportion it to the length of the superstructure in accordance with the length of deck protected, provided there were iron bulkheads at the ends of the superstructure. The question of length need not be taken into account in sailing vessels, and Mr. Martell thinks it is best done in the case of steamers by first arranging a table for normal proportions (in which the length does not exceed twelve times the depth) and then requiring increased freeboard for additional length in proportion to the excess of the ratio of the length to the depth above that of the normal proportions. Where, however, there are large spaces on deck, there does not appear to be so much need for increase in regard to excessive length. The case of spar-decked vessels is rather one of strength than otherwise, the question is the extent to which such vessels can be loaded so that the maximum tension at the gunwale when among waves would not exceed that of the full-scantling ship similarly placed. From calculations made, it is found that this condition is fulfilled by the ordinary practice of loading such ships. In the "depth of hold" rule before referred to, a curious anomaly obtains owing in the requirement of a proportion of the freeboard of full-scantling ships in spar-deck ships, and owing to such freeboard being measured from the main-deck. While this rule gives an amount of freeboard in small spar-decked vessels much in excess of that adopted in the best practice, in the largest size a spar-decked ship is actually allowed to load deeper than a full-scantling ship of the same size.

Mr. Martell then remarks that stability should also come into the question of freeboard. The questions of the nature of the cargo to be carried, the effect of stowage on stability, the season

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of the year, the destined ports and other considerations have been urged against the practibility of framing any tables which would meet all cases. There is much weight in such arguments, and whatever rules be adopted it will be necessary to inspect every vessel before finally determining her load-line. Some general rule is still necessary, and such rule ought to take in the *form* and other elements of the vessel in addition to the length, depth, or size.

The two papers were discussed together. Mr. Denny was opposed to the idea that large vessels needed greater surplus buoyancy. When a ship is foundering, as great an amount of surplus buoyancy is wanted to give time for escape from a small as from a large vessel. As to freeboard or surplus buoyancy for stability, he considered that statistic stability measured by metacentric height and dynamic stability as measured by freeboard were convertible values, as a ship may be equally safe with small metacentric height and large freeboard, or with large metacentric height and low freeboard.

Mr. West did not agree with Mr. Martell that freeboard was a question of strength. Safety he considered could not be other than relative, and if so, the question was—how much safety was required?

Mr. Withy, whose firm had built a good many well-decked ships, denied Mr. Rundell's statement as to deeper loading now than eight years ago. He laid much stress on the value of sheer in this class of ships; it is is often 20 in. in 100 ft., so that with 2 ft. freeboard amidships they had 4½ ft. aft and 8 ft. forward, and one ton buoyancy in sheer was more valuable than one ton amidships. Well-deckers have really less well than any other ships.

On Launching Velocities, by Mr. W. Denny, of Glasgow.

In this paper, Mr. Denny first gives particulars of means adopted to obtain the velocity of ships during launching for every half-second of the time they were in motion before leaving the ways. The highest velocity measured by him was ten and a half knots,

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the mean being about nine knots. The paper was, in concluding, described as merely an attempt to open the discussion of problems in connection with launching, which are still waiting far more extended observation and solution. For this reason we have not thought it desirable to occupy our limited space with more of what would only be of interest to a very limited number of our readers.

Lloyd's Rules as Affecting Marine Boiler Construction, by Mr. J. T. Milton, of Lloyd's Registry.

Statements have recently been made implying that the action of both the Board of Trade and Lloyd's as regards marine boilers, has hindered progress, especially as regards the advantages of high steam pressure.

Mr. Milton sets out to prove that such is not the case, and as regards the new forms or types of boilers, Lloyd's surveyors merely require that the novelty shall be submitted to them, and they never absolutely reject it, unless it is of a positively dangerous character. The only types which have been absolutely disallowed are the Perkins and Howard boilers, and they have at the instance of the owners been taken out of the ships in which they were placed and boilers of ordinary form substituted for them. In other cases, where a new type which was considered objectionable was allowed a trial, subject to special surveys, the suspicions have been justified by the results.

As regards the thickness of material required, Lloyd's rules really cut under the scantlings of a large number of boilers made by eminent firms of marine engineers, and fitted on board vessels classed in Lloyd's Register just prior to the time when the officers of that society commenced to survey machinery. This remark applies to boilers where the manufacturers carried out their own ideas of strength, the boilers not being built under Board of Trade supervision. Mr. Milton then goes at some length into practical details of the factors of safety for the shell plating of the staying of flat plates and the strength of furnaces, with a view to showing that taking into account their own experiments and what is otherwise known upon the subject and the peculiar

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condition to which marine boilers are subject, Lloyd's Register does in regard to safety insist upon no more than is really necessary.

In the discussion, Mr. McFarlane Gray said that Lloyd's rules were rules of expediency, and were framed to meet the ship-owners' view as to what will and will not pay. They were made to protect property, the Board of Trade rules were made to protect life, and its inspectors might have to enforce things which might not pay.

Mr. Parker said that Lloyd's rules as affecting marine boiler construction were sound, and took into consideration the various conditions involved more completely than those of the Board of Trade, and in particular they differed from the Board of Trade rules in that they were made upon recent experiments made by themselves on a large scale, on the properties of modern material, which enabled them to construct economical boilers with factors of safety suited to thin and thick plates.

On Cracks and Annealing of Steel, by Mr. A. C. Kirk.

This paper was an account of the cracking during working of a mild steel plate in June last, and of subsequent experiments made upon the remainder of the plate. The quality of the steel was proved to be good, and it would appear that the crack was caused by a flaw in the casting of the ingot, the flaw remaining in the steel all through the subsequent working.

Corrosive Effects of Steel on Iron in Salt Water, by Mr. J. Farquharson, of the Admiralty.

Attention has previously been drawn to this subject, but in cases where corrosion of iron in contact with steel has been observed the cause of the corrosion was uncertain, as there have been other instances of equally rapid corrosion where no steel was present. Large iron forgings being made up of numerous smaller ones, after being welded up into one whole contain more or less magnetic oxide (scale) which is as destructive as a like quantity of copper would be if placed in its stead. The well known fissures or deep seams which appear more or less in all rolled or forged iron when corroded by salt water, are wholly due to this cause,

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and these fissures bear in direction a certain relation to one another, by which they are readily known when the actual case is before us, but not otherwise. After referring to some previous experiments undertaken by the Admiralty for the purpose of ascertaining the extent of the galvanic action between black oxide and steel, Mr. Farquharson went on to describe those which form the special subject of his paper. The plates of iron and of steel were of the same size, each having an aggregate surface of 48 square feet. They were placed in a frame, parallel, and one inch apart, the iron and steel plates alternately. The first, third, and fifth pairs were electrically combined by straps of iron at the tops, the even pairs being left unconnected. Each plate of the latter therefore was only subject to ordinary corrosion. The whole were placed in Portsmouth Harbour and left undisturbed for six months, when they were taken up and weighed. It should be remarked that all traces of scale had been carefully removed from all the plates previous to immersion. The result of the experiments was that in the pairs which were unconnected the loss by corrosion was about the same in the iron as in the steel plates, but in the pairs electrically connected the iron plates lost double as much as in the unconnected pairs, while the loss of the steel plates was infinitesimal. That is, when iron and steel are electrically connected in salt water the steel is practically exempt from corrosion, but this immunity is secured at the expense of the iron. The known laws of galvanic action teach us further that if, in the electrically connected plates, the iron plate had been coated with some waterproof material with the exception of a patch in the middle, the result would have been serious injury to the plate by pitting of the exposed part on which a very large portion of the energy in such a case would be concentrated. Again, had the plates been placed edge to edge and contact maintained, the iron would certainly have suffered much on the edge next the steel.

The lesson taught by the results of these experiments is to avoid such combinations of iron and steel, or to take care to so modify the conditions as to minimise the injury to the iron. A careful examination of steel plates in this and former experiments has led

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Mr. Farquharson to the conclusion that the steel plates are not as good as they might be if the ingredients were more thoroughly mixed in the process of manufacture. In almost every plate there are evidences of local action between one portion and another, a sure indication that manganese is not evenly diffused throughout. In a recent visit to steel works it was observed, that when the furnace was tapped, as the molten steel began to run into the ladle, two men with a shovel each began to throw the ferro-manganese into the ladle, and this they continued to do until the steel was all in, no steps whatever being taken to mix by stirring or agitation. In such a process the wonder is that the results are no worse than they are found to be.

On Corrosion in Steam Boilers, by Mr. W. J. Norris.

The author, after remarking upon the great loss and anxiety caused by the rapid corrosion in steam boilers, goes on to discuss various theories of the cause of it :—galvanic action, the formation of hydrochloric acid, the formation of fatty acids from the lubricants, &c. His own theory which he goes into at considerable length is that corrosion is caused by the presence of free oxygen immediately above the water surface, and the remedy for the evil is to supply boilers with water free from air, and to keep oil and grease out of them.

On the Quality of Materials used in Shipbuilding, by Mr. H. H. West, of the Liverpool Underwriters' Registry.

Designers of structures of all kinds have, perhaps, been too prone to look upon what it is popularly known as malleable iron, as a material of definite and invariable qualties, prominent among which were ductility and the power of resisting tensile strains of about 20 tons per square inch. In the earliest days of iron shipbuilding the great confidence placed in the material was justified by its quality, the difference between that and the iron now frequently used is not at all creditable to us. As early as the time of the wreck of the *Royal Charter*, "boat plates," as they are called, had so far deteriorated in quality as to be spoken of by Sir William Fairbairn, in a letter to the *Times*, as being mostly rubbish. He

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said further :—" Out of the same boat-plate, or iron of that quality, two pieces have been taken, one of which sustained twenty-two tons to the square inch of section, while the other failed at five tons . . . . Boat-plates are shams. They are got up to deceive by appearances. Smooth and well-looking on the surface, the source of mischief lies hidden underneath." After this vigorous denunciation there was some improvement for a time but the exigencies of low-priced contracts eventually brought about the occasional if not the frequent use of bad iron.

The process of working iron into the ship does not necessarily reveal its defects. Most of the plates have but little curvature, and those which have, and are consequently much tried in working, are usually ordered of special quality. In consequence of the rapidity with which iron ships are now built, surveyors have not always the opportunity of detecting faulty plates, while the shipbuilder is to a very large extent in the hands of the iron-maker. In bad times he is compelled to use cheap material, in good times he is glad to get supplied with anything, as the demand on the manufacturer is then so great.

Scantlings of Classification Societies must be based, if not on the minimum, at least on the average quality of the materials used, and thus the practical outcome of all this is a permanent tax on the whole civilised community. Systematic tests of iron have not been required by the Classification Societies; they have, however, insisted upon such tests as a condition on which reduced scantlings are allowed for steel. In conclusion, Mr. West would urge upon iron-makers in their own interest to pass all their material through systematic tests of their own before issuing it to shipbuilders. If steel becomes somewhat cheaper, it will take the place of iron, unless the latter again establishes itself as a material which may be relied upon for uniformly good qualities.

Specimens of bad iron ship-plates were exhibited by the writer of the paper.

Mr. Martell urged that the specimens of iron shown must be from rejected plates, as no inspector who did his duty would permit such stuff to be worked into a ship. His experience was that very good iron was put into ships.

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Mr. Samuda held a contrary opinion, and thought thanks were due to Mr. West for a very able paper. Iron was worse now than it used to be. Lloyd's never tested an iron plate. He referred to a ship of large size of Lloyd's highest class, which, when knocked against by a barge, had four plates broken like glass.

Mr. Withy held that the shipowner should insist on iron being tested. He had known a 12-inch baulk to go through the side of a ship on the launching ways.

On the Transverse Strains of Iron Merchant Vessels, by Mr. T. C. Read, of Lloyd's Registry.

This was an account of some investigations into the strength of iron ships subject to transverse straining. The investigations were undertaken in the course of official duty at Lloyd's Registry, and the paper embodies the results of them. The case of strains caused by the vessel's resting upon blocks in dry dock is all that has been gone into at present. The paper, altogether, is not one of general interest.

On Progressive Trials, by Mr. J. Haward Biles.

This paper contains the details of a number of progressive speed trials of ships built by Messrs. J. and G. Thomson, of Glasgow, and remarks upon the results.

The remaining papers were:—"On the Durability, Construction, and Ballasting of Yachts," by Mr. T. Phillips, which we reserve for separate notice; and three papers on calculations connected with stability and trim, not of general interest; the titles of these papers were:—"On Curves of Stability of some Mail Steamers," by Mr. J. H. Biles; "Approximate Formulæ for the Calculation of Trim," by Mons. J. A. Normand, and "On the Reduction of Transverse and Longitudinal Metacentric Curves to Ratio Curves," by Mr. W. Denny.

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THE NEW EDDYSTONE LIGHTHOUSE.

ON Thursday, the 18th May, the new tower, which, during the last three and a-half years has been in course of construction upon the Eddystone reef, was formally commissioned by H.R.H. the Duke of Edinburgh. The ceremony was attended by the Trinity yachts *Galatea* and *Siren*, having on board the Deputy Master, Sir Richard Collinson, and many of the Elder Brethren and officials of the Trinity House, as well as sundry distinguished visitors; the Admiralty vessels *Vivid*, *Trusty*, *Perseverance* and *Carron*, took out the Mayor and Corporation of Plymouth, and the authorities of Devonport and Stonehouse. In addition, a number of steamers brought out the general public, and the scenes, both as the flotilla steamed out of Plymouth Sound, and as the numerous vessels grouped themselves around the Eddystone reef, were singularly picturesque. The weather was brilliant, there being just sufficient wind to impart a lively motion to the water, and a general appearance of briskness and vigour to the scene at the rock.

The history of the proceedings in connection with the new tower may be briefly stated as follows :—

In 1877 it was determined in consequence of the undermining of the rock, on which Smeaton's tower was built, to erect a new tower, the old building being at times subject to tremors and vibrations of a somewhat alarming nature.

After several careful surveys, a suitable base for a new tower was found on a rock at a distance of 40 yards from the old lighthouse in a S.S.E. direction, the only drawback to the selected rock being that its top is only just above the level of low water, and the foundation therefore had to be laid below the level of low water. The design of the new tower and the general arrangements in connection with the organisation of the staff and direction of the work were left entirely to Mr. James N. Douglass, the Engineer-in-Chief of the Trinity House.

The personal superintendence of the work was entrusted to Mr.

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T. Edmond, who possessed considerable experience in lighthouse building, and Mr. W. T. Douglass, the son of the engineer-in-chief above mentioned.

In the winter of 1877 and spring of 1878 the preliminaries were all arranged, and on the 17th July, 1878, the first landing on the rock was made, five others being made before the month was out. The first necessity was to build a coffer dam for the protection of the men while working, and to excavate, cut and bench the rock so as to prepare it for receiving the foundation courses. With the exception of a few small stones being carried away in October, the season was a successful one, and was prolonged until 21st December, when operations were suspended for the winter, about one-fourth of the protecting coffer dam having been completed and 1,500 cubic feet of rock excavated; 40 landings having been made, and 129 hours of work accomplished.

It should be mentioned that this period, while the men were working below the level of low water, was the most perilous. Not more than three hours at a time could be spent on the rock by the working party. From about three-quarters ebb to quarter flood tide was the utmost limit of their stay, and during that interval the utmost energy of all had to be exerted. With a rough sea, landing on the rock was simply out of the question, but often when at work, the party having perhaps effected an easy landing, the sea would get up, and then it would be necessary for all to seize their tools and hurry off to the boats as quickly as possible. Delay would probably mean being hauled off through the water, for no boat could venture near the rocks while the seas were breaking upon them.

The urgency for the construction of the coffer dam was so great that every nerve was strained to complete it. Work was even carried on on Sundays, when fair weather and a good tide offered.

In 1879 the first landing was made on the 24th February, and work proceeded rapidly. The coffer dam was completed by June, and then the shears, winches, &c., were set up for landing the stones. The method of carrying on the work may be briefly described as follows. The twin screw-steamer *Hercules*, employed in carrying from the work-yard at Oreston to the rock the material

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for the new tower, could carry 120 tones of stone, &c., and occupied a little more than an hour in making the passage. On each day, when there was a fair prospect of landing on the rock, the *Hercules* left Plymouth in time to arrive at the Eddystone reef soon after the beginning of ebb tide; on arrival she was warped into a position a very short distance from the rock, and made fast head and stern. In this position the vessel would be only about 30 or 40 feet from the rock. On the deck of the steamer a railway was fitted, on which a truck conveyed heavy loads, such as blocks of granite, bags of bricks or sand, and barrels of cement, to the stern of the vessel, whence they were carried to the rock by means of a double chain extending from a strong timber framework on board, to the crane on the rock, and worked over the pulleys by one of the powerful steam winches of the steamer. By this plan a three or four ton stone could be hoisted with comparative ease from the ship's deck up to the required height, and then dropped into its prepared place.

On the 19th August, 1878, H.R.H. the Duke of Edinburgh, Master of the Trinity House, in the presence of H.R.H. the Prince of Wales, Admiral Sir Richard Collinson, Deputy-Master, and many other Elder Brethren of the Corporation, laid the foundation-stone of the new tower. After this the work sped along, and the season closed on 19th December with eight courses laid. Strange to say, on the 21st and 22nd November the men worked on the rock for several hours by candle light! As many as 131 landings in the rock were made in 1879, and 518 hours of work accomplished.

On the opening of the season of 1880 much anxiety was felt as to the effect of the winter storms upon the work which had been left. On the 25th February the first visit was made, and it was found that the iron jib of the landing crane had been carried away, otherwise no damage whatever was done. The setting-up of the stones was briskly proceeded with, and the tower rose above the level of high water. The operations were not now quite so arduous; a longer time could be spent on the rock, and landings effected more easily. The masonry of the tower was in this season completed up to the 38th course, 110 landings having

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been made, and 657 hours of work expended up to the 9th November, the date of the final landing in 1880.

In 1881 the first visit to the new tower was on 18th February and the hoisting in and setting of stones went on with great rapidity until June, on the first day of which month H.R.H. the Duke of Edinburgh, who, as Admiral Superintendent of the Naval Reserves, was on coast-guard duty in the neighbourhood, laid the top stone of the tower. The extraordinary quickness with which the work so far had been executed, more rapidly in proportion to dimensions than any rock lighthouse previously undertaken, is explained by Mr. Douglass as being due chiefly to the special steam machinery and appliances for pumping, rock-drilling, and hoisting materials, &c., with which the steamer *Hercules*, employed upon the work, was fitted.

The tower consists of 2,171 stones containing 63,020 cubit feet or 4,668 tons of masonry. Smeaton's tower contained only 988 tons of stone. The sheer weight of the new tower is probably sufficient in itself to enable it to withstand a considerable force of wind or wave, but in addition to this every stone is dovetailed above, below and on all sides, as well as being joined with cement to the stones adjoining, on a plan which is an improvement of Smeaton's method. In Smeaton's tower four living rooms besides the lantern were provided, but in the new tower there are nine rooms each more lofty and commodious than any of those in the old building. The new tower has a cylindrical base from which the main lighthouse-shaft springs. The advantages of this plan are that the circular ledge formed by the cylindrical base offers great facilities for landing from a boat, and at low water affords a convenient promenade for the keepers. A life-line, which is fixed around the tower just above the level of the platform, might be extremely serviceable to shipwrecked sailors, if any such unfortunates succeeded in getting a foothold on the ledge.

Up to a height of 25½ feet above the level of high water, the tower is solid, with the exception of a large water tank let into the solid. The stone of which the new tower is constructed is granite of the best quality, from the quarries of Dalbeattie in

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Scotland and De Lank in Cornwall, by far the larger quantity coming from the latter. Many of the blocks weighed more than three tons, and were dressed and fitted at the quarry.

The Lantern.—The lantern surmounting this noble tower is a splendid piece of work, constructed by Messrs. Chance Bros. & Co., of Birmingham. It is cylindrical, 16½ feet high (which is higher than lighthouse lanterns usually are made, but this is necessary to accommodate the two burners, one above the other, which are placed there) and 14 feet in diameter. A very careful arrangement for thorough ventilation of the light-room is provided, which is most essential, having regard to the great heat which may at times be developed when the lights are burning. Fresh air can be copiously admitted through valves in the lower part of the lantern, and through a grating in the lantern floor which communicates with open windows in the service room below. The burners are thus plentifully supplied with the necessary oxygen, and streams of cold air ascending all round near the inner surface of the glass of the lantern tend considerably to check the condensation of moisture on the pains, which otherwise might seriously interfere with the effectiveness of the light.

The lantern, however, is unimportant compared with the apparatus inside for producing the light. In Smeaton's day the illumination was produced by 24 candles of six to the pound, arranged on a chandelier. No reflector of any kind aided the candle lights, and no provision was made for preventing the rays going in directions where, so far as the seaman was concerned, they were wasted. Early in the present century, however, the candles were superseded by 24 oil lamps with reflectors by means of which the light was greatly improved, both in regard to its power and its concentrated usefulness. In 1845 again a change was made, the Argand lamps and reflector being disestablished in favour of Fresnel's new dioptric system, by which one large central flame was employed, the rays from which were magnified and refracted (*i.e.*, bent in the direction required), by means of an arrangement of lenses and prisms surrounding the light at a distance of two feet or more on all sides, in form of a beehive. This apparatus, with a four-wicked lamp, has remained in operation

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until now, but the light in the new tower is of a vastly more important description than those which have preceded it in the old tower.

In speaking of a lamp having four wicks, it should be explained that these four wicks are concentric, or they may be described as four tubes of wick, the larger encircling the smaller ones, the innermost being about one inch, the outermost about three inches in diameter. When burning, all the four wicks are alight and yield a fine body of flame. Of late years Mr. Douglass has caused the intensity of the flame to be greatly increased by the addition of two more wicks of proportionately larger circumference than the outermost wick of the four-wick burner.

Two of these six-wick burners are fitted, one superposed on the other, the vertical distance between the two being about 6½ feet.

For ordinary purposes the upper lamp only will be used, the value of the light being 722 candles; with both lamps burning, the combined illuminating power is said to be equivalent to a quarter of a million of candles, or about six thousand times the intensity of the original candle light of Smeaton's time. What effect this enormous mass of light concentrated into flashes will have upon thick fog remains to be proved, but there can be little doubt that in misty, hazy, slightly foggy, rainy or snowy weather, the flashes will be serviceable to the mariner at distances which the old light could never have reached, even had it been of the same elevation as the new light.

Although in 1859 Mr. J. W. D. Brown provisionally protected an invention, the main feature of which consisted in the employment of two or more tiers or rows of lenses superposed with a separate light or set of lights for each tier or row, yet to Mr. J. R. Wigham, of Dublin, is due the credit of having first practically utilised this idea, with his biform, triform and quadriform gas apparatus. He employs two, three or four sets of gas burners superposed, each burner consisting of several rings of flame produced by concentrically arranged gas jets, the value of each burner being augmented by a glass dioptric apparatus. These superposed lights yield a splendid effect when in operation, as at Galley Head, on the Irish Coast.

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The glass apparatus at the Eddystone by which the effect of each burner is augmented and economised consists of a twelve-sided drum, each side, also called a panel, 6 ft. 3 in. in height and 1 ft. 8 in. in width, being formed by a central lens, or, as it may popularly be called, a bull's eye, and surrounded by concentric rings of larger bull's eyes, by which the same effect is obtained as though a portion of one huge lens of great thickness and weight, as large as the whole panel was employed. For purposes which will presently be apparent, the two bull's eyes of adjoining panels are brought close together, very much as though they were two eyes squinting, so that only lengthways they are in the middle of the panel. On the rotation of this twelve-panelled drum, with the inside central light burning, each bull's eye with its surrounding rings carries round a concentrated beam of light, which becomes visible to the outside observer as soon as by the rotation of the apparatus the focus of the bull's eye falls upon him. Now two bull's eyes are, as has been stated, brought close together, so close indeed that a small portion of each is cut off, consequently a very short interval occurs between the flash of the first and that of the second reaching the observer ; thus it will be seen the two flashes occur in quick succession and then nearly half a minute elapses before another pair of squinting eyes come round and discharge their two flashes. This description applies to one light only ; with the two lamps one over the other, two drums superposed are employed, one for each light, the two being identical in all respects and arranged so as to coincide exactly with each other. The height of the whole apparatus is consequently 12 ft. 6 in. and with both lights burning a magnificent effect is obtained.

The optical apparatus was manufactured at the works of Messrs. Chance Bros. & Co., of Birmingham, the calculation of all the angles of reflection, &c., being made by Dr. Hopkinson, F.R.S., a work which it is essential should be done with the highest degree of accuracy, in order that the lenses and prisms may be so adjusted as to intercept the rays of light proceeding from the lamp, and bend them so that they go out seaward in the desired direction.

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The following Notice to Mariners, issued by the Trinity House will indicate the general character of the light :—

NOTICE TO MARINERS. — *English Channel.* — *New Eddystone Lighthouse.*—Trinity House, London, 18th May, 1882.—Notice is hereby given, that the character of this light has been altered so that it is now *a white double-flashing half-minute light*, and will henceforth show, at an elevation of 133 feet above high water, *two successive flashes* of about 2½ *seconds* duration, divided by *an eclipse of about* 4 *seconds*, the second flash being followed by *an eclipse of about* 21 *seconds*. The light is visible all round the horizon, and in clear weather at a distance of 17½ miles. That a *white fixed* subsidiary *light* is also shown from a window in the Lighthouse at a distance of 40 feet below the flashing light, to mark the *Hand Deeps*. This extends over a sector of 16° from N. 32° W. to N. 48° W. (magnetic, from the Lighthouse). Also, that a large bell will be sounded during foggy weather twice in quick succession every half-minute; thus assimilating the character of the sound signal to that of the light.

Note.—Mariners will observe that the light on the Casket Rocks, 78 miles S.E. ½ E. magnetic from the Eddystone, is similar in character, but shows *three* flashes in quick succession instead of *two*.—By order, J. INGLIS, Secretary.

YACHT-BUILDING AND LLOYD'S YACHT REGISTRY.

THE establishment in 1878 of a special branch of Lloyd's Registry and the promulgation of special rules for the building and the survey of yachts, was a step which could not fail to usefully direct the attention of shipbuilders and naval architects to that class of vessels. One consequence of it is a paper read at the recent meetings of the Institution of Naval Architects by Mr. B. T. Phillips, of Lloyd's, on the "Durability, Construction and Ballasting of Yachts," giving the results of experience obtained in surveying, and thus being of very considerable value. There can be but one opinion as to the

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usefulness of the Yacht Registry. In addition to its furnishing a guarantee for the excellence of the materials and workmanship of vessels built under its surveyors, the rules as to the size of the various parts of the frame and planking, and fastenings, furnish a standard which without being so rigidly adhered to as being a barrier to improvement, does yet secure to the purchaser of a yacht that the vessel is what he supposes her to be, and what he pays for. Many yachts built under the old state of things, and by respectable builders, are of course of the highest degree of excellence, as regards strength and durability, but it is also a well-known fact that many have been built so very slight that when put to really hard work they have shown signs of weakness, and have caused much trouble and expense to their owners. Yachts were classed in the ordinary register of Lloyd's previous to 1878, but not to any large extent. For one thing the rules of that Register are framed for vessels which have to bear strains caused by heavy cargoes, and vessels built under them would thus be unnecessarily strong and heavy. The new register thus will do good in both directions; classed yachts will not in future be uselessly heavy and expensive, while there will be strong inducements to a pretty general classing of yachts. That this is likely to be the case is shown by the statement with which Mr. Phillips begins his paper, that in the four years of the existence of the Yacht Registry, the number of classed vessels had risen from fifty-nine in 1878 to 230 in 1881, and that the majority of the yachts building in the spring of this year were being built to class. It would appear from the fact that several yachts built of wood which were in existence in 1835 and have received only trivial repairs, are still in good order, that they are not so liable to decay as ordinary merchant vessels. Mr. Phillips attributes their comparative immunity in this respect to the evil effects of cargoes which supply the germs of decay in the hull of the vessel, and to the difficulty of ventilating merchant vessels. We think it may also be attributable to the fact that yachts are in actual work but a small part of their existence, and that mostly in the summer.

He goes on to notice some causes of decay, which might

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easily be remedied. Iron ballast is sometimes removed when a yacht is laid up for the winter, but in some cases it has been known to be in as long as ten years continuously, the result being in wooden vessels considerable decay of the keelson, floors, and ceiling; in iron vessels oxidisation and waste. Removal of the ballast even at intervals of two or three years would much reduce this danger. Still worse is the case where the ballast is of lead, and in an iron or composite vessel. In such cases galvanic action goes on between the lead and iron and at the expense of the latter, and in vessels of this class it is clearly necessary to remove the lead ballast and clean and paint or otherwise coat the ironwork after every season.

Another fruitful source of danger is the closing up of the structure of the yacht by irremoveable cabin fittings. The side panellings of cabins should, on the contrary, be made to ship and unship in order that the inside of the plating and frames in iron and composite yachts should be accessible for examination or repairs. Cases could be quoted where from this want of means of access to the sides of iron yachts, plates have wasted away by leakage from side ports. Such water could, however, be carried from the sill of the port to the bottom by means of a small drain pipe between the frames. We may add that this danger is often increased from the fact of the rims of the ports, &c., being made of brass. It is also in the case of wood yachts a consideration that when signs of straining from bad weather, &c., have rendered extra strengthenings necessary, the expense has often been much increased by pulling down and replacing the fittings, all of which might be divided if they were made to ship and unship. Other causes of local decay have been noticed, such as leakage from tanks to supply closets at the ends of the vessel, leakage from bulwark stanchions, and the dirty but common practice of throwing water below the forecastle flooring into the coal or coke locker. The use of English elm for deadwoods, at one time a common practice, but now nearly obsolete, has resulted in a necessity for extensive repairs in a few years. Mr. Phillips also gives it as an experience of his own that extensive decay has taken place in outside planking of pitch and red pine when the vessel has

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been lying up in harbour, and thus part of the bottom planking has been alternately wet and dry. We should be disposed, from what is well known of the properties of pine, to think that these cases are exceptional. Pitch pine is not, for other reasons, the best material for topsides, if much exposed to the sun; numerous rents soon appear which in thin planks become a cause of leakage or decay. In looking through the table, giving the number of years' class allowed for various materials in the Registry, we notice that English and American elms are only allowed for any class whatever for keel and bottom planking to within two feet of the load-line. For these purposes they are allowed in ships of the highest (*i.e.*, fourteen years) class.

Mr. Phillips then goes to the question of the construction of yachts, noticing that for some years past the tendency had been to decrease the weight in the upper works in order to carry extra ballast below. We have in other articles referred at length to the thoroughly unsatisfactory character of yacht tonnage rules, due to their not taking the depth into consideration. Almost any system of measurement would be better than the present, which encourages deep vessels with heavy lead keels. Mr. Phillips gives sketches of one type of vessel in which half of the frame timbers were stopped some feet short of the gunwale, and the shelf was not bolted to the frame timbers at all, but only to the bulwark stanchions. In other cases, in order to keep down the breadth (the most influential dimension in racing tonnage), the topside planking was much reduced in thickness. When these and similar devices are resorted to, it is no wonder if the vessels show signs of weakness, and it may be remarked that when they do, and strengthening has to be introduced, it invariably involves much more top-weight than would have resulted from proper construction in the first instance. The superstition that for a vessel to sail well she must not be too strong, must in fact "give" a little, is so far as merchant ships are concerned exploded by the performances under sail of iron ships, which are well known to be perfectly rigid. For yachtsmen its fallacy has been illustrated by the successes of two well known cutters, the *Samæna*, a strong wood yacht, well fastened, and classed 15 A 1; and the *Vanduara*,

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a steel vessel, classed 100 A 1. When lead ballast is carried, the surveyors to the Registry have recommended extra strengthening in the shape of iron plates at the sides of the frames in wooden vessels. In iron vessels nothing is easier than to obtain the additional transverse strength required by partial bulkheads or by extending the reverse frames to the gunwale, &c.

Mr. Phillips devotes a considerable portion of his paper to the important question of ballast. It is hardly necessary for us here to repeat our protests against the present fashion of excessive ballast as part of the evil system by which yacht sailing is degraded from a scientific contest to a competition of cunning devices for cheating tonnage. As things go at present, heavy ballasting is a necessary evil, and the important question is how to minimise its evil effects. Ballast is sometimes, when placed inside the vessel, merely dropped into the openings between the frames; it would be much better if it were so arranged that the frames and not as in such cases the outside planking should take the weight of it. Sometimes when lead ballast has been introduced in place of iron, the owner has been so foolish as to have it run in between the floors in a molten state, the consequence being that the inner edges of the outside plank were so much shrunk that the vessel afterwards could not be kept tight.

Of late years yachts have been built in such a way as to make ballast form a part of the frame of the vessel. Keelsons have been fitted of cast iron and lead, and in some cases the garboard strakes have been of lead fastened and caulked in the same manner as if they had been of wood. The smoothness of the lead, however, prevented good caulking. Another more common system is to have metal floors, in some cases cast iron, in others lead, and in a third plan, a combination of iron and lead has been used, sometimes a casting of iron filled up with lead, sometimes the iron part being formed from an angle bar. This has again led, with a view to avoid expense, to the system of stepping all the frames on each side of the ship against a deep keel through which they are bolted together. Iron and composite yachts however lend themselves more readily to arrangements for the carriage of low inside ballast. In the steel yacht *Vanduara*, already referred to, the keel is of a

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trough form, and a large portion of the ballast is of lead run in between the floors, the bottom being first thoroughly cemented, and after the lead had cooled, liquid cement was run in around and above it till a thick layer of cement was formed above the lead, upon which again loose lead ballast could be placed if required. Experience in a former case is considered to prove that by these precautions the lead and iron, or rather steel, are so effectually kept apart that no galvanic action will take place.

Coming lastly to the most effective form of ballast, outside keels, it is usually the case, if they are merely supplementary to other forms of ballast, to secure them to the wooden keel by dovetail plates of yellow metal at intervals and by up and down bolts driven obliquely into the wooden keel. The lead keels being in separate pieces, sources of weakness are introduced at the butts of the pieces forming them. With a still heavier keel as noticed by Mr. Phillips in connection with the wooden yacht *Samœna*, it was found necessary to fit it in two depths and the butts of one were arranged so as to shift with those of the other. In this case the keels were fastened by yellow metal bolts driven down through each floor, and having nuts outside hove up on the lead keel. In other cases, the up-and-down bolts have been supplemented by dove-tail plates at the sides of the keels, and the separate pieces of the lead keel have been scarphed together. It will readily be seen that when such a large weight depends upon the bolts, it is most important that they be of good quality. If a lead keel were to drop off when a vessel was under a press of sail the consequences might be most serious. Cases have occurred of lead keels dropping off in harbour through the breaking of metal bolts, and it is said that some builders use pure copper for the purpose. Of course every practical shipwright knows that "yellow-metal" may mean anything, sometimes through excess of zinc it is inferior, perhaps more often from imperfect mixing of the zinc and copper. Iron bolts, sometimes galvanised iron, have also been used, the result being as one might expect, galvanic action between the iron and lead and a rapid wasting of the former. A wise precaution recommended by the writer of the paper is to always have dovetail plates in addition to up-and-down bolts.

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Those of our readers who are personally interested in yachts, all are sympathetically interested in them, will thus see that Lloyd's Yacht Registry has had, and is likely to have, an important effect for good upon the building and construction of these vessels.

GREENWICH HOSPITAL SCHOOL.

THE report is published of the committee appointed by the Admiralty to inquire into the Greenwich Hospital School. The following is a summary of some of their recommendations :—

"That a junior school be established of 400 orphan sons of warrant officers, petty officers, and seamen of the Royal Navy; of warrant officers, non-commissioned officers and privates of the Royal Marines (and of men in the Royal Naval Reserve killed or drowned in Her Majesty's service or on drill); that they be admitted to the junior school without any fixed qualifying standard, except that they be healthy, physically fit for school work, and free from any infirmity of body or mind; that the junior school be for educational purposes only; that no engagement be entered into as to these orphans binding themselves for continuous service in the Royal Navy until they reach 12½ years of age; that a nautical school be established of 600 boys, to be open alike to sons of warrant officers, petty officers, and seamen of the Royal Navy; of warrant officers, non-commissioned officers, and privates of the Royal Marines, and of men of the Royal Naval Reserve, to be admitted between 12½ and 14 years of age, that they should attain a physical standard on admission and sign an engagement with the consent of their parents or guardians for continuous service in the Royal Navy, and if not required or are ineligible for the Royal Navy but fit for sea service, that they shall enter the Mercantile Marine and join the Royal Naval Reserve; an upper nautical school, to consist of 50 boys, to be selected by competitive examination from boys of the nautical school under 14 years of age; 50 other boys to be admitted to the upper

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nautical school between 13 and 14 years of age as day scholars, on payment of fees, to be instructed in navigation and nautical astronomy; preference to be given to sons of officers and others connected with the Royal Navy and Royal Naval Reserve; orphan boys of the junior school to be transferred to the nautical school at 12½ years of age, if up to the standard, physically fit, and on signing the engagement as to sea service; otherwise they may be retained until 13 years of age, and be instructed in a trade; total orphans and other very special cases in the junior school fit for industrial training, but not for sea service, to be retained until 14 years of age, and be instructed in a trade; the scheme of seamanship instruction in training should be adopted at Greenwich; proposal as to a training ship in the Thames for practical instruction of boys after 15 years of age destined for the Royal Navy or Mercantile Marine; the practical knowledge would shorten their course in the Royal Naval training ships, decreasing their cost to the country, and as regards boys for the Mercantile Marine, it would fit them to commence their career, and cause them to be sought after by shipowners; the course of instruction to be assimilated to that of the Royal Naval training ships."

The Committee express their sense of the very efficient manner in which Greenwich Hospital School is conducted, and say that no establishment they have visited in the course of their enquiries has given them greater proof of organization, cleanliness, and careful working.

North Atlantic.—Bay of Biscay.—Derelict Vessel North-Westward of Cape Penas.—The master of the British steam-vessel *Ixia*, reports having on the 8th April passed the derelict vessel *Concurrenten of Osterreison* (water logged, with foremast, main and mizen topmasts gone) in lat. 44° 5′ N., long. 6° 50′ W. —about 45 miles north-westward of cape Peñas. This vessel presented a danger to shipping. In this locality, the drift current may be considered to set in an easterly direction (*true*) at the rate of about one mile an hour.

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MACCLESFIELD BANK AND PARACEL ISLANDS—CHINA SEA.

THE following information is the result of a survey of Macclesfield Bank, made in H.M.S. *Magpie*, August, 1881; and also of a visit of that ship to the Paracel Islands, by Lieutenant-Commander A. Carpenter.

MACCLESFIELD BANK lies between the latitudes of 15° 25′ N., and 16° 10′ N., and the longitudes of 113° 43′ E., and 114° 57′ E.; it is about 75 miles long, by 37 miles broad, of an oval shape, and may be described as a submerged atoll reef, the central part having greater depths than the edge or rim of the exterior part of the bank.

The bank may be seen from aloft on approaching, by the greenish colour of the water; there is a general depth of from 9 to 15 fathoms coral on the rim, which varies in breadth from one quarter of a mile to 3 miles.

Within the rim, the depths range from 30 to 55 fathoms, sand, with occasional patches of coral. The coral is living where the depths are shallow, but the remainder appears to be of an encrusting species; there are patches of jubipora, or organ pipe coral (red), of very fragile structure.

The depth of the surrounding ocean is about 1,800 fathoms, the bottom, globigerina ooze; the south face of the bank is almost perpendicular to 600 fathoms, the west is very steep, but the north face slopes gradually from 60 fathoms close to the rim, to 200 fathoms at 13 miles northward. Near the rim on the south-west side of the bank, there is a bay or curve about 7 miles across, but bottom was not obtained at 90 fathoms.

Current.—During the month of August the current was found to set north-easterly, at from half to three-quarters of a knot per hour. In heavy weather the sea on the edge of the bank is high and confused.

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Note.—A depth of 4 fathoms was reported by the Siamese vessel of war *Bankok*, in 1857, on the north-west side of the bank, situated approximately in lat. 16° 2¼′ N., long. 114° 2½′ E.

PARACEL ISLANDS AND REEFS.

Lincoln Island.—Pyramid Rock is about 20 feet high.

Dido Shoal.—H.M.S. *Magpie* in 1881 passed over the assigned position of this shoal without seeing any indication of it, although a careful look-out was kept from the three mastheads.

Crescent Chain.—Duncan Islands.—A shoal of 5 fathoms or less, lies midway between Duncan Islands and Antelope shoal; but the passage is apparently clear for one and a-half miles to the westward of the islands.

Several low trees are growing on Duncan and Drummond Islands.

Pattle Island may be distinguished by a single high tree.

Tides.—It is high water, full and change, about 6 h.; springs rise 8 feet.

[*All bearings are magnetic. Variation* (*Paracel Islands*) 1° 15′ E.]

Diego Garcia, as a Coaling Station.—In the centre of the Indian Ocean, and south of the Equator, lie the islands, shoals and reefs which constitute the Chagos Archipelago; the largest island is Diego Garcia, and the whole group is a dependency of Mauritius. Diego Garcia is inhabited, and has three estates on it at which oil is manufactured. The harbour is safe when due caution is exercised, and it is proposed by the Orient line of steamers to establish a coaling station here, as the island lies conveniently *en route* from Aden to Australia. The archipelago has been carefully surveyed and is often visited; a full description will be found in any of the Indian Ocean Directories. H.M.S. *Eclipse* was there in July, 1881, and furnishes the latest report which does not vary from information previously obtained.

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CORRESPONDENCE.

HEAVING-TO IN STEAMSHIPS.

To the Editor of the "Nautical Magazine."

Dear Sir,—I read with much interest the letter of my shipmate (Captain Shackford) on "Heaving-to in Steamships" during heavy gales in the North Atlantic. Although we sailed together on board the *Oceanic*, the subject was never mooted between us, thus rendering my remarks of more value. Many years ago I left Liverpool in command of a small steamer well down in the water; but, as it was in the summer, bad weather was not anticipated. However, on the second day from land, one of those gales, similar to that which H.M.S. *Agamemnon* encountered when laying the first Atlantic cable, sprang up, accompanied with an unusually heavy sea. After a few hours the wind veered from S.W. to N.W. in regular Atlantic fashion, and we made very bad weather. The little vessel had ample power for manœuvring, and every possible device was tried to make her lie easy, but all failed. The hull shook under the weight of water as wave after wave was hurled on the light spar deck.

There was a risk of its being crushed in, or of the engine-room skylight giving way, and as a last resource the engines were stopped, and a new main staysail set. During many minutes I could hardly believe the results. Under the pressure of the gale a considerable amount of drift took place, leaving a well-defined wake to windward. It appeared to me that immediately the great waves reached a certain point in this wake they rolled over short of the ship, only sending a shower of spray on board. For some time the general impression continued that the waves which fell short did so by chance, but after watching the heaviest breaking harmlessly to windward, when from their appearance they bid fair to sweep all before them, doubts gave way to certainty. On this occasion the helm was put amidships.

The last winter will long be remembered as one of the most disastrous ever known. Occasionally letters were published by

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shipmasters complaining of the small power of their steamers, and its effects on heaving-to. I am inclined to believe that by following out the plan of Captain Shackford they will come safely through gales where any amount of power would fail them.

In times of trouble men grasp at anything that offers a chance of relief. A favourite suggestion of many is, heaving-to under the lee of a drogue—indeed, I am under the impression that patents have been taken out for drogues. In very small short vessels, where the dragging power exerted bears a good proportion to the actual pull on the warp, the plan may be followed with advantage. Fishermen constantly heave-to their small craft in this fashion, either by hanging on to their nets or by using other gear for the purpose. But let anyone who thinks it may be applied to long heavily-laden vessels note the strain which is required to pull one head to wind, when drifting rapidly broadside on. The hawser and drogue, which were not equal to the task, would be an expensive encumbrance, probably never used for the purpose ostensibly given out. It is pretty certain that the effect of keeping the engines of a low-powered boat going ahead in strong gales is a serious source of mischief. It destroys or lessens the drift without bringing the sea into the position most favourable to the ship. By these tactics, the wave, in lieu of being tripped up, breaks with resistless force on the exposed side, causing certain damage, and not unfrequently something more. Very naturally, commanders are anxious to push on, still, in many instances, judiciously heaving-to is a saving of time and money. Heavy driving in all but the strongest class of ships ultimately injures hull and machinery, thus rendering repairs necessary, as well as entailing a serious loss of time, which to the shipowner is money.

W. W. KIDDLE.

LYING-TO IN A GALE.

To the Editor of the "Nautical Magazine."

Sir,—Having read in the March number of the *Nautical* the letter (copied from the *New York Herald*) of Captain Shackford of the American steamship *Illinois*, in which he relates his experiences in

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lying-to with machinery stopped in heavy gales, I venture to offer some remarks on the subject, which I trust may not be altogether out of place.

Without commenting on the writer's actual experience, I think his letter calculated to induce others to attempt dangerous experiments, as what holds good in one instance may not do so in all. There have been cases similar to the writer's, it must be admitted, when vessels have lain in the trough of the sea with machinery or rudder damaged for hours or even days without sustaining any material injury; but I fear that these have been the exception and not the rule, as how many results have been far different.

I think that in cases like Captain Shackford's, there will generally be found some extenuating circumstances, if I may use the expression, which ought to be considered before taking his certainly very simple manœuvre as a standpoint in seamanship. A finely-modelled and not deeply-laden steamer when disabled may live in a sea which would submerge an ordinary cargo vessel, though the latter may be built as strongly as steel or iron will permit.

I was myself through all the heavy gales of the last two unusually severe winters, and quote a case in point. On the 17th of October last, when in an iron steamship hove-to eighty miles to the eastward of the Flemish Cap in a terrific sea, the vessel was struck when about four points off the wind, not having steerage or headway at the time (being, in point of fact, unmanageable), by a sea which stove the bow, breaking nine of the frames, side ports and gangways, and demolished the upper bridges; as the sea was running at the time with furious and continual breach, I do not hesitate in saying that had the ship been a-trough at the time she would have been overwhelmed. It may be suggested that when the vessel is in the trough altogether, the sea, acting on her entire length, will have more lifting power than when four or five points on the bow, and so lessen the danger of being submerged; but, in this case, it must be remembered that the rolling will generally be so excessive that a lurch in the wrong direction at the wrong moment may present the decks to an overtopping and breaking sea, when the result will at once be disastrous.

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Besides, the danger, by the heavy rolling, of having the boilers unseated or the cargo shifted, cannot be ignored.

I think that these considerations ought to be sufficient to induce an ordinarily prudent man to endeavour at all times to keep his vessel's bow to the sea, when it is unsafe to run.

Yours faithfully, J. H. MALET,

Late Commanding S.S. *Marengo*, Wilson Line.

29th April, 1882.

CAPE MACHICHACO LIGHT, N. COAST OF SPAIN.

The following letter, addressed to Messrs. R. H. Laurie & Co., Chart Publishers of Fleet Street, has been sent to us for publication :—

Dear Sir,—In your Light Book it says that the light on Cape Machichaco, on the north coast of Spain, is fixed with flash every *four* minutes, but I have found it only flashes every *three* minutes, the same as Santona light to the westward of Bilbao ; consequently both lights are alike, and I regret to say I have been twice deceived by the same light ; instead of being at Santona, as expected, I was at Machichaco, which was very annoying, as you may be sure. You know we cannot always depend on the log. There ought to be some difference in the lights as the shipping to this port is getting very great, and I have heard of other masters being deceived by the same light.

I remain, yours very truly, H. J. HYDE,

Master of s.s. *Norway*, of West Hartlepool.

Bilbao, April 18th, 1882.

[The light apparatus at Cape Machichaco may be temporarily out of order ; we knew that Santona light was irregular. The former should be a 4-minute and the latter a 3-minute flash ; but the light on Cape Machichaco is much the finer of the two.—Ed. *N. M.*]

CHANNEL NAVIGATION.

We have received a letter from "P. H. C." on the above subject which we are compelled to defer publishing until our next number.

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BOOKS RECEIVED.

The Eddystone Lighthouses (*New and Old*). *An Account of the Building and General Arrangements of the New Tower;* by E. Price Edwards; *with an Abridgment of Smeaton's Narrative of the Building of the Old Tower.* By T. Williams. London: Simpkin, Marshall & Co. 1882.

A short and popular account of the course of operations connected with the construction of the New Eddystone Lighthouse is sure to be appreciated not only by our nautical readers but by the general public; and in the production of the small work before us Mr. Edwards has treated the subject well—the narrative being all the more readable and none the less accurate through the omission of all technicalities. The history of the building of the old tower, a structure which has withstood the waste of time and the ravages of old ocean for upwards of a century, is but little known, Smeaton's *Narrative* being a comparatively scarce work; it was therefore well determined to reproduce the salient features of that great architect's original edition, and the abridgment has been carefully prepared by Mr. T. Williams. Thus we have, in a small compass, the history of the Old and the New Eddystone Lighthouses, illustrated with appropriate diagrams which assist the text. The work is dedicated to H.R.H. the Duke of Edinburgh, Master of the Trinity House, who laid the foundation-stone of the new tower on the 19th of August, 1879, and lighted the new apparatus on the 18th of May, 1882.

Normalörter fur die Taifune in den chinesischen und japanischen Meeren des Jahres, 1881. Von E. Knipping, Tokio, Japan.

The progress and development of Typhoons in the China and Japanese seas in 1881 is the author's latest contribution to the history of storms. He gives us the account of eight cyclones, traced very nearly from their birth to their death: of these, the storms that occurred in the early part of the year had not an extensive range, those of September traverse a wider and larger

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area. We think it is time Mr. Knipping's collections were examined to see if his observations develope any meteorological law. It would be well if he gave us the expected frequency and range of typhoons for the different months of the year.

The Marine Steam Engine, a treatise for the use of Engineering Students and Officers of the Royal Navy. By Richard Sennett, Chief Engineer, Royal Navy, First Assistant to the Chief Engineer, H.M. Dockyard, Devonport, &c. &c. London: Longmans, Green and Co. 1882.

THE object of this work is the provision of a text-book on the marine engine for the use of students of marine engineering and of officers of H.M. Navy who desire to have some acquaintance with the subject, and hence the illustrations and details largely but not exclusively have reference to ships of war. Mr. Sennett's treatment of the subject is thorough and he is quite up to date, which is in itself a valuable recommendation. The illustrations of details are numerous and good. Manuals of the steam engine are plentiful enough, but by confining himself to the marine engine and its accessories the author has produced a work which will be very valuable to the numerous class of readers who wish to know all about marine engines and ship propulsion, but do not care to make themselves acquainted with the details of engineering on shore as well as afloat. One chapter is devoted to a consideration of the various kinds of propellers, another to some important subjects usually left out of books on the marine engine. Very good descriptions are given of pumping and fire arrangements, of steam and hydraulic steering machinery, and of other auxiliary machinery. While giving as we have said excellent woodcut illustrations set in the letter-press to which they refer, and full information on every part of the subject, Mr. Sennett's book possesses the merit of being so written as to be intelligible to the general reader.

Gesundheitspflege auf Seeschiffen, mit besondorer Berücksichtigung der Handelsflotte. Von Dr. J. J. Rénacke. Hamburg. 1882.

THIS work is an enquiry into the conditions of health and disease in ships both as regards seamen and passengers. Part of it is

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given to the consideration of health, as affected by the ventilation of the various parts of the vessel set apart for residence, whether of passengers or ship's company, the effect on health of the bilge-water, cargo, ballast, and the respective healthiness of iron and wood ships. This part is headed, "The ship as a dwelling;" and it may be interesting at the present time when so much emigration is taking place from the continent, both direct to the United States and through England, to quote the regulations to which competing lines are subject.

The law of the United States requires that in vessels bringing immigrants for each adult on the upper-deck there must be 16 square feet, and on the lower deck 18, unless the height between decks is 7½ feet, in which case the allowance is 14 square feet. The English law requires for emigrants 15 square feet on the upper passenger deck, 25 square feet on the lower deck if the height be less than 7 feet, but if more it is 18 square feet. In Hamburg the space required for each adult emigrant is 10½ square feet if the height between decks is over 5⅔ feet; if between 5½ and 5⅔ feet the area required is 12½ square feet. In Bremen the space required for each adult is 10¾ square feet.

One chapter of the work is devoted to the character of provisions and water used at sea, another to diseases incidental to sea voyages, including sea-sickness, and we may say that a marked feature of the whole book is that thoroughness of treatment and fulness of detailed information so often found in works issued from the German press.

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TIDE TABLES FOR JUNE, 1882.

Also Ports of Reference for the Constants in the next Table.

Week Day.	Month Day.	LONDON BRIDGE.		HULL.		NORTH SHIELDS		LEITH.		DEVONPORT.		DOVER.		WESTON-SUPER-MARE.		LIVERPOOL.		GREENOCK.		QUEENSTOWN.		KINGSTOWN.		LONDONDERRY.		BREST.	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
		H. M.	H.M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
Th	1	1 16	1 37	5 45	6 6	2 42	3 2	1 39	1 59	4 57	5 19	10 27	10 50	6 10	6 33	10 39	11 0	11 25	11 47	4 18	4 40	10 30	10 50	7 22	7 43	3 4	3 24
F	2	1 58	2 17	6 27	6 48	3 22	3 42	2 19	2 39	5 40	6 1	11 13	11 36	6 55	7 17	11 21	11 42	—	0 9	5 2	5 23	11 10	11 30	8 3	8 22	3 45	4 6
S	3	2 38	2 58	7 10	7 32	4 2	4 23	2 59	3 19	6 21	6 41	11 59	—	7 38	7 59	—	0 4	0 30	0 52	5 45	6 7	11 51	—	8 41	9 1	4 27	4 48
S	4	3 17	3 40	7 54	8 16	4 45	5 7	3 41	4 3	7 2	7 23	0 22	0 45	8 20	8 41	0 26	0 48	1 14	1 36	6 29	6 51	0 13	0 36	9 21	9 42	5 10	5 32
M	5	4 1	4 23	8 38	9 0	5 30	5 54	4 25	4 48	7 44	8 6	1 9	1 34	9 2	9 23	1 10	1 32	1 58	2 21	7 18	7 36	0 59	1 23	10 4	10 27	5 55	6 18
Tu	6	4 46	5 10	9 24	9 48	6 19	6 45	5 13	5 39	8 29	8 52	1 59	2 24	9 44	10 6	1 54	2 18	2 44	3 8	8 0	8 24	1 48	2 14	10 52	11 21	6 42	7 8
W	7	5 33	5 59	10 13	10 41	7 11	7 39	6 7	6 36	9 16	9 41	2 50	3 16	10 28	10 51	2 43	3 9	3 32	3 58	8 48	9 13	2 40	3 8	11 55	—	7 35	8 3
Th	8	6 27	6 55	11 12	11 46	8 10	8 43	7 6	7 38	10 8	10 36	3 42	4 8	11 15	11 41	3 36	4 5	4 25	4 53	9 39	10 6	3 38	4 9	0 32	1 10	8 31	9 0
F	9	7 24	7 54	—	0 21	9 17	9 53	8 11	8 45	11 6	11 39	4 34	5 1	—	0 11	4 36	5 9	5 22	5 52	10 35	11 6	4 41	5 15	1 50	2 30	9 31	10 4
S	10	8 25	8 59	0 55	1 27	10 28	11 1	9 20	9 54	—	0 16	5 29	5 59	0 42	1 15	5 45	6 22	6 24	6 56	11 40	—	5 47	6 18	3 6	3 37	10 39	11 15
S	11	9 36	10 9	1 57	2 27	11 33	—	10 26	10 57	0 54	1 31	6 30	7 4	1 50	2 26	6 59	7 33	7 29	8 3	0 15	0 50	6 49	7 20	4 4	4 30	11 50	—
M	12	10 40	11 15	2 57	3 27	0 4	0 33	11 27	11 55	2 7	2 41	7 38	8 11	3 2	3 38	8 4	8 34	8 36	9 8	1 25	1 59	7 51	8 22	4 56	5 22	0 23	0 55
Tu	13	11 48	—	3 57	4 27	1 1	1 28	—	0 22	3 13	3 42	8 42	9 11	4 14	4 48	9 2	9 29	9 39	10 9	2 31	3 2	8 52	9 22	5 47	6 12	1 26	1 54
W	14	0 19	0 45	4 56	5 21	1 55	2 20	0 49	1 15	4 10	4 36	9 39	10 5	5 19	5 47	9 54	10 18	10 36	11 2	3 30	3 56	9 49	10 12	6 37	7 1	2 20	2 44
Th	15	1 11	1 36	5 45	6 9	2 43	3 5	1 40	2 4	5 0	5 23	10 30	10 55	6 14	6 39	10 41	11 4	11 27	11 52	4 21	4 45	10 34	10 55	7 25	7 48	3 8	3 31
F	16	2 0	2 20	6 33	6 56	3 27	3 48	2 26	2 46	5 45	6 7	11 20	11 43	7 2	7 24	11 27	11 49	—	0 15	5 8	5 30	11 16	11 37	8 9	8 28	3 53	4 14
S	17	2 44	3 4	7 17	7 37	4 9	4 29	3 6	3 25	6 28	6 48	—	0 5	7 44	8 3	—	0 9	0 37	0 58	5 50	6 10	11 57	—	8 46	9 4	4 34	4 53
S	18	3 22	3 44	7 57	8 16	4 49	5 8	3 44	4 3	7 5	7 21	0 26	0 47	8 21	8 39	0 29	0 48	1 18	1 37	6 29	6 48	0 17	0 37	9 22	9 39	5 11	5 29
M	19	4 4	4 22	8 35	8 54	5 27	5 47	4 22	4 43	7 37	7 54	1 7	1 27	8 57	9 14	1 7	1 25	1 55	2 14	7 7	7 26	0 56	1 16	9 57	10 15	5 48	6 7
Tu	20	4 40	4 59	9 18	9 32	6 7	6 27	5 2	5 22	8 11	8 28	1 47	2 7	9 31	9 47	1 48	2 1	2 38	2 52	7 45	8 3	1 36	1 56	10 34	10 54	6 26	6 45
W	21	5 17	5 35	9 50	10 9	6 47	7 7	5 42	6 3	8 44	9 0	2 26	2 45	10 3	10 18	2 20	2 39	3 10	3 28	8 26	8 38	2 16	2 36	11 17	11 41	7 4	7 23
Th	22	5 54	6 16	10 29	10 52	7 28	7 50	6 24	6 46	9 17	9 35	3 4	3 24	10 34	10 51	2 58	3 18	3 46	4 5	8 56	9 15	2 56	3 17	—	0 8	7 43	8 4
F	23	6 36	6 57	11 16	11 48	8 14	8 40	7 10	7 35	9 55	10 19	3 44	4 5	11 10	11 32	3 39	4 1	4 26	4 48	9 35	9 57	3 39	4 4	0 37	1 7	8 27	8 51
S	24	7 20	7 45	—	0 11	9 8	9 38	8 2	8 31	10 44	11 10	4 26	4 48	11 56	—	4 26	4 54	5 11	5 33	10 21	10 49	4 31	4 59	1 40	2 18	9 17	9 45
S	25	8 11	8 39	0 39	1 8	10 9	10 41	9 2	9 36	11 41	—	5 18	5 41	0 24	0 55	5 26	6 0	6 4	6 35	11 21	11 54	5 28	5 58	2 46	3 18	10 17	10 53
M	26	9 9	9 47	1 36	2 8	11 13	11 44	10 8	10 38	0 16	0 58	6 11	6 42	1 26	2 2	6 30	7 11	7 8	7 41	—	0 27	6 28	6 58	3 47	4 15	11 28	—
Tu	27	10 22	10 51	2 38	3 8	—	0 14	11 8	11 39	1 31	2 6	7 15	7 47	2 36	3 10	7 48	8 19	8 14	8 46	1 0	1 33	7 28	7 58	4 40	5 8	0 1	0 32
W	28	11 25	11 54	3 37	4 6	0 42	1 8	—	0 31	2 39	3 10	8 17	8 47	3 44	4 18	8 41	9 7	9 16	9 41	2 8	2 33	8 27	8 53	5 26	5 48	1 2	1 26
Th	29	—	0 21	4 33	4 58	1 33	1 57	0 58	1 25	3 40	4 7	9 13	9 39	4 49	5 18	9 51	9 54	10 11	10 33	2 53	3 15	9 24	9 49	6 11	6 34	1 58	2 20
F	30	0 46	1 9	5 21	5 44	2 20	2 43	1 49	2 13	4 33	4 58	10 4	10 29	5 46	6 11	10 17	10 40	11 1	11 23	3 35	3 56	10 12	10 34	6 57	7 20	2 48	3 6

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TIDAL CONSTANTS

For Various British, Irish, and European Ports.

By applying the Tidal Constant of the place, according to its sign (+ *add* − *sub.*), to the time of high water on the given day at the port of reference, you have the time of high water at the place sought.

Place.	Constant.	Port of Reference.
	H. M.	
Aberdeen	−1 17	Leith
Aberystwyth	−3 52	Liverpool
Alderney	+2 59	Brest
Antwerp	+5 13	Dover
Arbroath	−0 42	Leith
Arcachon	+0 50	Brest
Arklow	−2 25	Kingstown
Ayr	−0 18	Greenock
Banff	−1 49	Leith
Bantry harbour	−1 14	Queenstown
Barnstaple bridge	−0 26	Weston-s.-Mare
Bayonne	−0 2	Brest
Beachy head & Rye bay	+0 8	Dover
Beaumaris	−0 51	Liverpool
Belfast	+2 42	Londonderry
Berwick	−1 5	N. Shields
Blyth	−0 8	N. Shields
Bordeaux	+3 3	Brest
Boulogne	+0 18	Dover
Bridport	+0 22	Devonport
Bristol & King Road	+0 19	Weston-s.-Mare
Cadiz	−2 2	Brest
Caernarvon	−1 56	Liverpool
Calais	+0 37	Dover
Campbellton	−0 28	Greenock
Cardiff	+0 2	Weston-s.-Mare
Cardigan bar	−4 22	Liverpool
Carlingford bar	−0 10	Kingstown
Chatham	−0 47	London
Cherbourg	+4 2	Brest
Coleraine	−1 37	Londonderry
Coquet Road	−0 23	N. Shields
Cordouan Tower	−0 10	Brest
Cowes (West)	−0 27	Dover
Crinan	+4 41	Greenock
Cromarty	−2 21	Leith
Dartmouth	+0 33	Devonport
Deal & Downs	+0 3	Dover
Dieppe	+7 19	Brest
Donaghadee	+0 3	Kingstown
Donegal harbour	+0 17	Queenstown
Douglas & Ramsay	−0 11	Liverpool
Dublin bar	+0 2	Kingstown
Dundalk	−0 16	Kingstown
Dungeness	−0 27	Dover
Dunkerque	+0 56	Dover
Exmouth	+0 38	Devonport
Falmouth	−0 46	Devonport
Fecamp	+6 57	Brest
Ferrol	−0 47	Brest
Flamborough head	−1 59	Hull
Fleetwood	−0 12	Liverpool
Folkestone	−0 5	Dover
Fowey	−0 29	Devonport
Flushing	+1 42	Dover
Galway bay	−0 26	Queenstown
Gibraltar	−1 27	Brest
Glasgow (Port)	+0 10	Greenock
Gloucester	+2 51	Weston-s.-Mare
Granville	+0 26	Brest
Gravesend	−0 48	London
Grimsby (Great)	−0 53	Hull
Guernsey (St. Peter)	+2 50	Brest
Hartlepool	+0 5	N. Shields
Harwich	−1 52	London
Havre	+6 4	Brest
Helgoland	+0 21	Dover
Holyhead	−1 12	Liverpool
Holy Island harbour	−0 53	N. Shields
Honfleur	+5 42	Brest
Inverness	−1 59	Leith

Place.	Constant.	Port of Reference.
	H. M.	
Jersey (St. Helier)	+2 38	Brest
Kinsale	−0 18	Queenstown
Lerwick (Shetland)	−3 47	Leith
Limerick	+1 15	Queenstown
Lisbon Bar	−1 17	Brest
Littlehampton	+0 24	Dover
Llanelly bar	−0 38	Weston-s.-Mare
Lowestoft	−4 1	London
Lynn & Boston Deep	−0 29	Hull
Margate	−2 18	London
Maryport	+0 3	Liverpool
Milford Haven entr.	−0 58	Weston-s.-Mare
Montrose	−0 52	Leith
Morlaix	+1 6	Brest
Needles point	−1 26	Dover
Newcastle	+0 23	N. Shields
Newhaven	+0 39	Dover
Newport	+0 16	Weston-s.-Mare
Nieuport	+1 6	Dover
Nore	−1 28	London
Orfordness	−2 43	London
Oporto	−1 17	Brest
Ostende	+1 13	Dover
Padstow	−1 41	Weston-s.-Mare
Peel, Isle of Man	−0 15	Liverpool
Pembroke Dock	−0 42	Weston-s.-Mare
Penzance	−1 18	Devonport
Peterhead	−1 43	Leith
Piel harbour, Barrow	−0 18	Liverpool
Plymouth breakwater	−0 6	Devonport
Poole	−2 2	Dover
Port Carlisle	+0 47	Liverpool
Portland breakwater	+1 18	Devonport
Port Patrick	−0 58	Greenock
Portsmouth	+0 29	Dover
Ramsgate	−2 19	London
Rotterdam	+4 33	Dover
Santander	−0 17	Brest
Scarborough	+0 48	N. Shields
Selsea bill	+0 33	Dover
Sheerness	−1 21	London
Shoreham	+0 22	Dover
Sligo bay	+0 17	Queenstown
Southampton	−0 42	Dover
Spurn point	−1 8	Hull
St. Ives	−2 10	Weston-s.-Mare
St. Malo	+2 18	Brest
St. Mary (Scilly)	−1 16	Devonport
St. Nazaire	−0 7	Brest
Stornoway	+6 38	Greenock
Stromness (Orkneys)	−5 17	Leith
Sunderland	−0 1	N. Shields
Swansea bay	−0 53	Weston-s.-Mare
Tay bar	−0 11	Leith
Tees bar	+0 22	N. Shields
Tenby	−1 12	Weston-s.-Mare
Thurso	−5 49	Leith
Torbay	+0 17	Devonport
Tralee bay	−0 58	Queenstown
Ushant (Quessant)	−0 15	Brest
Valentia harbour	−1 19	Queenstown
Waterford	+0 19	Queenstown
Westport	−0 4	Queenstown
Wexford	+2 20	Queenstown
Whitby	+0 22	N. Shields
Whitehaven	−0 9	Liverpool
Wick	−2 55	Leith
Wicklow	−0 41	Kingstown
Workington	−0 19	Liverpool
Yarmouth road	−4 43	London
Youghall	+0 13	Queenstown

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MARINE INVENTIONS.

Monthly List of Patents—Compiled for this Journal by Messrs. W. P. Thompson and Boult, British and International Patent and Trademark Agents and Consulting Engineers, 323, High Holborn, London, W.C.; and Berridge Street, Leicester; also by Messrs. W. P. Thompson & Co., 6, Lord Street, Liverpool.

ENGLISH (APPLICATIONS).

1887. John Wigham Richardson, of Neptune Works, near Newcastle-upon-Tyne. "Improvements in compound marine steam-engines."

1899. Thomas Lambert, of Plymouth. "Improvements in screw-propellers."

1932. Albert Augustus Young, of Boston, Suffolk, Massachusetts, U.S.A. "Improvements in self-levelling ships' berths." (Complete specification.)

1957. John Ericsson, of New York, U.S.A. "Improvements in means for turning, directing and steering steamships and other vessels." (A communication.)

2000. Don Pastor Pérez de la Sala, of Sevilla House, Navarino Road, Hackney, Essex. "Improvements in life-saving and floating appliances."

2011. David Johnston, of Govan, Renfrew, North Britain. "Improvements in means and apparatus for diminishing the liability to corrosion of screw-propeller blades."

2085. Anthony John Davison, of Sunderland. "Improvements in screw-propellers and appliances connected therewith."

2180. George Charles Lilley, of Osborne Road, Finsbury Park, Middlesex. "Improvements in instruments or apparatus for recording distances travelled by ships or navigable vessels, applicable also for enabling the speed of the tide to be ascertained."

2197. Claude (otherwise Claudius) Martin, of Brighton. "Improvements in anchors."

2199. Fritz Maringer, of Düsseldorf, Prussia, Germany. "Improvements in steamship screws." (A communication.)

2200. Andrew White Tuer, of Leadenhall Street, London, and James Cleminson, of Westminster Chambers, Westminster.

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"Improvements in the method of and apparatus for indicating a ship's position by the display of signal lights."

2234. Marshall H. Holmes, and Jacob R. Steiner, both of St. Paul, Ramsey, Minnesota, U.S.A. "An improved life-preserving bed or mattress for use on board ship." (A communication.)

2243. Archibald Kennedy, Marquis of Ailsa. "Certain improvements in the construction of capstans."

2245. Joseph Ray Hodgson, of Limehouse, Middlesex. "Improvements in life-buoys, boats, or floating apparatus, suitable for being employed for rescuing persons in case of shipwreck or disaster at sea, or as a means of communication between two vessels or the shore, or for conveying stone or other materials used in the construction of piers, lighthouses, breakwaters, sea-walls, and other harbour works, or as an anchor boat, applicable also for landing troops, horses, guns, and stores, or as deck seats for passenger vessels, which can be used as life-rafts or as life-buoys to hang over the ship's side or stern, and for other like useful purposes."

2258. William Henry Whettem, of 29, Noble Terrace, Gateshead, Durham. "Improvements in ship's windlasses and bow stoppers."

AMERICAN.

254160. Elisha Robbins, of Worcester, Massachusetts. "An anchor support."

254161. Elisha Robbins, of Worcester, Massachusetts. "An anchor supporter."

255144. Nathan B. Clark, of Philadelphia, Pa. "An armour-clad ship."

255157. Jacob Foose, of Lancaster, Pa. "A steamer."

AUSTRIAN.

A. J. A. Lagne, of Paris. "A submarine torpedo-boat with a continuous submersion."

BELGIAN.

57490. J. B. Pastoreau, of Paris. "A boat called 'maritime hawker' (bum boat)."

57503. E. S. Copeman, of Downham Market. "Improvements in the construction and arrangement of seats, on vessels, boats, &c."

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FRENCH.

144427. Andrée. "A screw-propeller."

144444. Whitley. "A life-buoy."

144572. Haxeland. "Improvements in rowlocks and oars for ships' and other boats."

GERMAN.

18329. J. Taylor, of Birkenhead. "A friction coupling box for capstans."

18330. J. Ericsson, of New York, U.S.A. "A torpedo-boat."

18366. A. Figge, G. A. Köttgen and H. Wedekind, of London. "Jointed rudders."

18369. J. Nordenfelt, of London. "Submarine boats."

PATENTS PUBLISHED.

4210. Sidney Pitt. (A communication from Raoul Pierre Pictet, of Geneva, Switzerland.) "Improvements in the construction of boats and vessels." September 29th, 1881. This invention has for its object so to construct boats or vessels that their speed will be increased and navigation facilitated. The keel of such vessel is a parabolic curve of peculiar construction, the concavity of the curve being directed downward from stem to stern; the bottom of the vessel is flat in the middle and curves up towards the bows. The tendency of this ship will be to rise out of the water when travelling, so that it will ride on the waves.

832. W. Robert Lake. (A communication from John B. Root, of Portchester, New York, United States of America, Manufacturer.) "An improved method of, and means for, propelling vessels." February 21, 1882. 6d. The main feature of this invention consists in a screw or equivalent device arranged to move the water transversely to the line of movement of the vessel, and direct it against or away from inclined surfaces of the hull so as to drive the vessel forward or backward. Two pairs of screws for instance may be employed, each pair on an independent shaft extending across the vessel. The pitch of one pair is opposed to the pitch of the other. The hull is made sharp both at stem and stern, and the water is thrown against the sides where they are tapering off, or is driven away therefrom.

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MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
181	English Channel — Eddystone New Lighthouse	Formally opened May 18th, by H.R.H. The Duke of Edinburgh.
182	England — South Coast—Runnel-stone Buoy	Altered in character and position.
183	Ireland — East Coast — Liffey River Entrance	Intended new light.
184	North Sea—Elbe River—Mielstacks	Light temporarily discontinued.
185	Baltic Entrance — Flensborg Fiord	Lights discontinued.
186	„ „ Eckenförde Bay	New harbour light.
187	„ „ Lubeck — Travemunde	Arcs of visibility.
188	Norway — West Coast — Torg-fiord — Somnœs—Jernholmen	New light.
189	France (Coasts of)—Catoptric Lights	Arcs of visibility.
190	Spain—West Coast—Vigo Bay	Alterations in buoyage.
191	Mediterranean—Sicily—Port Palermo	Buoy marking mole extension.
192	„ Adriatic—Sabbioncello Peninsula—Cape Gomena	Particulars of light.
193	Black Sea—Dniepr or Kherson Bay	Alteration in Channel lights.
194	„ Kertch Strait—Tuslinski	Light-vessel (temporarily) replaced by beacon.
195	Red Sea—Zebayir Islands—Jebel Zebayir	Discovery of shoal ground.
196	Africa—West Coast—Gaboon River—Libreville	New harbour lights.
197	„ Coast of Angola—St. Paul de Loando	New lighthouse on reef; semaphores, &c.
198	India—West Coast—Bombay Harbour	Changes in buoyage.
199	Bay of Bengal—Ceylon—West Coast—Colombo	Particulars of works in progress.
200	„ „ East Coast—Batticaloa	Non-existence of shoal (*Brennus*).
201	„ „ „ Batticaloa Road—Surveyor Rock	New buoy.
202	Eastern Archipelago—Sumatra—West Coast—Padang—Pulo Pisang Besar	Particulars of light.
203	„ Philippine Islands—Zebu Island—Port Zebu	New lights at south entrance.
204	South Australia—Spencer Gulf—Germein Bay	Light on jetty.
205	„ Gulf of St. Vincent —Port Adelaide	Semaphore jetty light improved.
206	South America — Rio de la Plata — Camillia Rock	Rock does not exist.
207	„ Rio de la Plata—English Bank	Destruction of lighthouse while building.
208	West Indies—Puerto Rico—West Coast —Jiguero Point	Reported sunken rock.
209	„ „ N.E. Coast—Cape San Juan	New light.
210	United States—New York—Long Island —Sag Harbour—Cedar Island	New fog-signal at lighthouse.

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NAUTICAL NOTICES.

All Bearings Magnetic, unless otherwise stated.

181.—English Channel.—*Eddystone New Lighthouse.*—The new lights as indicated in the April number of the *Nautical Magazine*, p. 302, are now in full operation; as is also the fog-bell. Opened by H.R.H. the Duke of Edinburgh, Master of the Trinity House, on May 18th.

182.—England.—*South Coast.—Runnel-Stone Buoy.—Alteration in Character and in Position.*—A *Boat bell* buoy (Sherwell's), which has been experimentally tried at the Runnel-stone (Rundlestone), near the Land's End, is now substituted for the bell buoy previously marking that danger. This buoy (sounded on the principle of the Spit-bell buoy at Spithead) is moored with the beacons near Tol Peden Penwith in line, half a cable southward of the position of the old bell buoy.

183.—Ireland.—*East Coast.—Liffey River Entrance.—Intended Occulting Light North Side of Channel.*—On 28th June, 1882, a light will be exhibited from a lighthouse (beacon, No. 1) recently erected on the northern side of the channel, Liffey river, about 1¼ mile within the entrance. The light will be an *occulting white* light, showing a *flash every three seconds*, elevated 40 feet above high water.

184.—North Sea.—*Elbe River.—Mielstacks Light temporarily discontinued.*—From the 1st April, 1882, and until further notice, the light will be discontinued.

185.—Baltic Entrance.—*Flensborg Fiord.—Discontinuance of Harbour Lights at Eken Sound and Flensborg.*—The fixed light on the pier at Eken sound (Eckensund); also the two green lights and the red light on the steam-vessels' pier in the inner part of Flensborg (Flensburg) harbour, are discontinued. During the winter months, *red* lights are only shown at dusk from hand lanterns on the piers at Eken sound and Flensborg harbour, as a guide to steam-vessels.

186.—Baltic Entrance.—*Eckenförde Bay.—Harbour Light at Eckenförde.*—A harbour light only (of small power) is now

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exhibited at Eckenförde. The light, shown from a dwelling close to the harbour, is a *fixed red* light, elevated 18 feet above the sea (14 feet above the ground), and visible from a distance of about two miles.

187.—Baltic Entrance.—*Lübeck Bay.—Travemünde Principal Lights.—Arcs of Visibility.*—The high light (fixed white) exhibited at Travemünde is shown through an arc of 105° or between the bearings of S. 7° W. and N. 68° W.; but it is obscured by Brothener (Broddner) shore on the western side, and by the high land of Schwansee and Klütz on the eastern side, so that to vessels approaching from seaward, it is only visible between the bearings of S. 17½° W. and S. 78½° W. This light is brightest on the bearing of S. 60° W., and this intensity is nearly maintained when bearing from S. 44° W. to S. 74° W. The low light (fixed white), exhibited from the same tower as the high light, is shown through an arc of 104°, or between the bearings of S. 7½° W. and N. 68½° W.; but it is obscured by the high land in the same directions as the high light, and is also brightest on the bearing S. 60° W. *Variation*, 12° *W.*

188.—Norway.—*West Coast.—Torg Fiord.—Somnæs.—Light on Jernholmen.*—Exhibited on Jernholmen, northern side of entrance to Somnœs harbour; it is a *fixed* light, showing *red* on easterly and south-easterly bearings, and *white* towards the harbour; it is obscured in the northern part of Torg fiord by the western point of Sylskjœrets. The light is exhibited from 15th August to 30th April, and visible from a distance of 8 miles. Position, lat. 65° 22′ 30″ N., long. 12° 12′ 0″ E.

189.—Coasts of France.—*Catoptric Lights.—Arcs of Visibility within Certain Distances.*—On the coasts of France, lights of the catoptric character (or by reflectors), and which are described as being visible through a limited arc, may be seen when the light is approached within the distance of $\frac{3}{10}$ths or $\frac{4}{10}$ths of the given range of visibility, 55° to 60° on each side of the centre of such arc—that is, when not otherwise obscured. Thus:—On the north coast of France, the light exhibited on Lanvaon heights, L'Abervrac'h river entrance, and which is visible from a distance of 14 miles through an arc of 36°—or 18° on each side of the

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leading mark (Lanvaon and Vrac'h islets lights in line)—can be seen when within the distance of 5 miles from the light through an arc of about 115°—or about 57° on each side of the above-mentioned line of direction.

190.—SPAIN.—*West Coast.—Vigo Bay.—Alterations in Buoyage.*—A *conical* buoy, painted black, has been moored in 7¼ fathoms water, on the southern edge of Subrido point, northern side of entrance to Vigo bay. A *conical* buoy, painted red and surmounted by a white globe, has been moored in 10¾ fathoms water, near the edge of Monteferro shoal, between Estela de Tierra and the mainland, on the northern side of Puerto de Bayona.

Note.—Further notice will be given of the definite position of Monteferro shoal buoy.

Rodeira shoal buoy, which was driven on shore from its position on the northern shore of Vigo bay during a gale, is temporarily replaced by a *cask* buoy.

191.—MEDITERRANEAN.—*Sicily.—Port Palermo.—Buoy Marking Northern Mole Extension.*—The Northern mole at Port Palermo is to be extended 131 yards in a S. 22° E. direction; and as it is advanced, its extremity will be marked by a spar buoy, surmounted by a frame globe, painted white.

Note.—Vessels must pass southward of this buoy. *Variation*, 10¾° *W.*

192.—MEDITERRANEAN.—*Adriatic. — Sabbioncello Peninsula.—Particulars of Cape Gomena Light.*—The light (fixed white), shown from a turret of reddish masonry, 37 feet high and situated 23 feet within the extremity of the cape, is now visible seaward through an arc of 261°, or between the bearings of N. 6° E. and S. 87° W.; it is elevated 34 feet above the sea, and visible from a distance of 11 miles. *Variation*, 9¼° *W.*

193.—BLACK SEA.—*Dniepr or Khersón Bay Entrance.*—On the opening of navigation in 1882, in order to indicate the channel at the entrance to Dniepr or Khersón bay, the following alterations would be made in the lights exhibited at Berezan, and on fort Nicolaevski:—

(1.) *Alterations in Berezan Lights.*—Two lights are now exhibited from lighthouses recently erected near Berezan (Bérésanski) lake—the old lighthouses will remain for a time

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until demolition. The high light (Upper Victorovski) is a *fixed white* light, elevated 120 feet above the sea, and visible from a distance of about 12 miles. The lighthouse is situated on the elevation westward of Berezan lake, about $1\frac{1}{10}$th miles N.N.E. of the old upper lighthouse. The low light (lower Victorovski) is a *fixed red* light, elevated 97 feet above the sea, and visible from a distance of about 8 miles. The lighthouse is situated on a bluff near the guard-house on the south-eastern side of Berezan lake, distant $2\frac{1}{4}$ miles S. $42\frac{1}{2}°$ E. from the high lighthouse. Position approximate, lat. 46° 37′ 40″ N., long 31° 27′ 30″ E.

(2.) *Alterations in Fort Nicolaevski Light.*—The light (Dneprovski-Limanski) shown from fort Nicolaevski, about $1\frac{1}{4}$ mile S. by E. of Ochakov point, and which was previously visible in all directions, now shows a *fixed white* light through an arc of 7°, or between the bearings of S. 80° E. and S. 87° E.; it is elevated 11 feet above the sea, and visible from a distance of about 4 miles. In addition to this sector of 7°, there is shown from the same lighthouse, as a guide to vessels approaching from Ochakov (Otchakow) and Dniepr bay a *fixed white* light, visible through an arc of 180°, or between the bearings of N. by W. $\frac{1}{4}$ W. (through west) and S. by E. $\frac{1}{4}$ E.; it is elevated 11 feet above the sea, and visible from a distance of about 4 miles.

194.—Black Sea.—*Kertch Strait.—Tuslinski Light-Vessel Temporarily Replaced by Beacon Buoy.*—Tuslinski (Toulinski) light-vessel is undergoing repair, and will not be placed in position near the S.W. extreme of Tuzla bank, until further Notice; and a beacon buoy, painted black and surmounted with a globe, has been moored in place thereof. *Variation*, 8° *W.*

195.—Red Sea.—*Zebáyir Islands.—Shoal Ground off Jebel Zebáyir.*—Commander P. Aldrich, H.M. surveying vessel, notifies existence of two sunken rocks, lying respectively off the N.E. and S.E. coasts of Jebel Zebáyir, the largest island of the Zebáyir group:—

(1.) A rock, with a least depth of $5\frac{1}{2}$ fathoms over it, lies 8 cables from the N.E. extremity of Jebel Zebáyir, with the following bearings:—North (Barn) hill, Jebel Zebáyir, S.W. $\frac{1}{4}$ S.; Northern end of sandy beach, Saba islet, W. $\frac{1}{4}$ N.

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(2.) A rock, with a least depth of 4 fathoms over it lies $1\frac{1}{10}$ths mile from the S.E. coast of Jebel Zebáyir with the following bearings :—South extreme of Centre Peak island, W. by S. ½ S. ; South hill, Jebel Zebáyir, W. by N. ¼ N.

Note.—South-eastward of Jebel Zebáyir and centre peak islands the soundings are very irregular for a distance of three miles. *Variation*, 4½° *W.*

196.—AFRICA.—*West Coast.—Gaboon River.—Harbour Lights at Libreville.*—Two harbour lights are exhibited at Libreville (the Plateau), right bank of Gaboon river. The northern light, shown 5 feet within the extremity of the northern pier, is a *fixed red* light ; the southern light, shown 16 feet within the extremity of the southern pier, is a *fixed green* light. Position approximate, lat. 0° 23′ 25″ N., long. 9° 26′ 30″ E.

Note.—By keeping the three lights (forming a part of the lighting of the Plateau) in line bearing N. 76½° E., the extremities of the piers and the rock in the entrance of the harbour will be avoided. *Variation*, 17½° *W.*

197.—AFRICA.—*West Coast.—Coast of Angola.—St. Paul de Loando.—Light on Loando Reef, withdrawal of Light-vessel.*—The erection of a small lighthouse on the N.E. extremity of Loando reef at the entrance of that harbour, would be completed in April, 1882, and a light exhibited therefrom ; it is a *fixed white* light, visible from a distance of 10 miles. Further notice will be published in due course. Also, on the exhibition of this light, the light-vessel previously marking the extremity of Loando reef, would be withdrawn.

(2.) *Semaphore on Fort San Miguel.*—A Semaphore station has been established on fort San Miguel, San Paul de Loando. Vessels passing or entering the harbour, can communicate by the International Code of signals.

(3.) *Semaphore at Ambriz.*—A Semaphore station has been established at Ambriz. Vessels can communicate by the International Code of signals.

198.—INDIA.—*West Coast.—Bombay Harbour.—Changes in Buoyage.*—On the 1st May, 1882, several changes would be made in the buoyage of the harbour, and in future the following system

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will be adopted, approximating, as near as practicable, to the system sanctioned by the Government of India :—

1. Buoys with poles and triangles will mark the north end of shoals, &c.

2. Buoys with poles and globes will mark the south end of shoals, &c.

3. All black buoys to be left on the starboard-hand when entering the port.

4. All red buoys carrying globes or triangles to be left on port-hand when entering.

5. Buoys coloured both red and black, with poles and triangles, can be passed on either port or starboard-hand, and to the north.

6. Buoys coloured both red and black, with poles and globes, can be passed on either port or starboard-hand, and to the south.

7. Red nun buoys will mark isolated rocks.

8. Mooring buoys will be coloured white.

9. Wreck buoys will be coloured green.

10. The Quarantine Anchorage buoy will be coloured yellow, and will carry a black flag.

11. The Flagstaff shoal buoy will remain of the same description and colour as at present.

Note.—The buoy marking the Sunk Rock shoal will now be removed.

199.—BAY OF BENGAL.—*Ceylon. — West Coast. — Colombo Harbour.—Particulars of Breakwater Light, Buoy Marking Works in Progress.*—With reference to Notice in 1881, on the exhibition of a red light from a boat moored as close as practicable to the extremity of the breakwater now in course of construction at Colombo harbour, throughout the south-west monsoon, when the *Titan* is not in position. Captain Maclear, H.M. surveying vessel *Alert*, states that in February, 1882, the light was then (north-east monsoon) shown from the *Titan* at the end of the breakwater, which latter had been extended to a distance of about 1000 yards from the shore. The light (red) is moved outwards as the works progress ; it is elevated 45 feet above the sea, and is visible from a distance of 10 miles. A buoy, painted red, is moored about one cable northward of the end of the breakwater,

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to mark the extremity of the submerged rubble base. Vessels should pass northward of this buoy.

200.—*Bay of Bengal—Ceylon—East Coast—Non-existence of Shoal Reported Distant Four Miles from Batticaloa.*—With reference to the reported existence of a shoal (on which the steam-vessel *Brennus*, drawing 22 feet, struck) stated to lie about 4 miles off shore with Batticaloa flagstaff bearing about S.W. by W. ½ W., searches having been made for this reported danger in H.M.S. *Ready*, and by the Colonial Government, which show that no danger exists so far distant from the land, in the direction reported, and in such deep water (25 to 32 fathoms). From these examinations, taken in connection with the evidence collected, it is considered that the *Brennus* struck on a shoal not heretofore charted, lying with Batticaloa flagstaff bearing S. 7° W., distant 7½ cables, situated in the midst of known shoal coral ground. This new shoal, with a least depth over it of 15 feet, lies 8¼ cables N.W. of the 7-feet shoal known as Tower rock; 6 cables W. ¼ S. of the 12-feet shoal known as Beacon rock; and 8¼ cables E. by S. of the 19-feet shoal known as Surveyor rock. *Variation*, 1¼° *E.*

201.—Bay of Bengal. — *Ceylon.—East Coast. — Batticaloa Road.—Buoy North-Eastward of Surveyor Rock.*—From 15th March to 31st October, a buoy, painted red, would be placed 25 fathoms N.E. by N. of Surveyor rock, Batticaloa road. From this position of the buoy, Surveyor and Khandalla rocks are in line with the white obelisk on the shore.

202.—Eastern Archipelago.—*Sumatra.—West Coast.—Padang. —Particulars of Pulo Pisang Besar Light.*—The harbour light on the south-west point of Pulo Pisang Besar (Pisang Gedang), southern approach to Padang roads is *fixed* white, shown from an iron support, elevated 75 feet above high water, and visible from a distance of 12 miles.

203.—Eastern Archipelago.—*Philippine Islands.—Zebú Island. Port Zebú.—Lights at Southern Entrance.*—Two lights are now exhibited at the Southern entrance to port Zebú (Cebú), east coast of Zebú island.

Lipata Bank Light (the western) is a *fixed red* light, elevated

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26 feet above the sea, and visible from a distance of 6 miles. It is shown from a crane with wooden support on Lipata bank with the following bearings: Cahuit point, N. 9° E.; Talisay church, S. 89° W. Position approximate, lat. 10° 14′ 30″ N., long. 123° 52′ 20″ E.

Lanis Point Light (the eastern) is a *fixed green* light, elevated 26 feet above the sea, and visible from a distance of 6 miles. It is shown from a pole on Lanis point (extending from Tambon point), with the following bearings: Cahuit point, N. 28° W.; Talisay church, N. 87° W. *Variation*, 1° *E.*

204.—South Australia.—*Spencer Gulf.—Germein Bay.—Light on Jetty.*—Exhibited from the extremity of the jetty in Germein bay. The light is a *fixed red* light, visible from a distance of about 4 miles. Position approximate, lat. 33° 4′ 0″ S., long. 138° 1′ 0″ E.

205.—South Australia.—*Gulf of St. Vincent.—Port Adelaide. —Semaphore Jetty Light.*—Additional power has been established in the lighthouse at the extremity of the Semaphore jetty, port Adelaide. The light (*fixed green*) should be visible seaward between the bearings of N. 65° E. and S. 33° E. from a distance of 5 miles. *Variation*, 5¼° *E.*

206.—South America.—*Rio de la Plata.—Unsuccessful Search for Camillia Rock.*—The following account from the senior naval officer on the south-east coast of America, relates to an unsuccessful search for Camillia rock, stated to lie W. by N. from Flores Islet lighthouse, distant 2¼ miles. This rock (reported as having 12 feet water over it, with 4¾ fathoms muddy bottom, close around, on which the British ship *Camillia* is said to have struck) was searched for by H.M.S. *Firefly* in January, 1882:—Lieutenant Law commanding, reports having anchored near the reported position of the danger, and to have carefully sounded round it during seven days, without finding any indication of a rock. The depth over and the soundings around Sara bank, correspond closely with those given of Camillia rock; the bearing of the two dangers from Flores Islet lighthouse is also identical, though they differ in distance 1¼ mile. From the above, it is considered that Camillia rock does not exist; it has therefore been expunged from the charts. *Variation*, 8° *E.*

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207.—SOUTH AMERICA.—*Rio de la Plata.—English Bank.—Destruction of Lighthouse in Course of Construction.*—With reference to Notice in 1881, on the intended exhibition of a light, probably about the end of March, 1882, from a lighthouse then in course of construction, the works commenced for the construction of the new lighthouse, near the north end of English Bank, Rio de la Plata, were washed away during a gale on the 12th September, 1881.

208.—WEST INDIES.—*Puerto Rico.—North-East Coast.—Light on Cape San Juan.*—On 2nd May, 1882, a light would be exhibited from a lighthouse erected on Cape San Juan (Cabeza de San Juan), the N.E. extremity of Puerto Rico; it is a *fixed white* light, with *red* flashes *every three minutes;* elevated 265 feet above the sea (47 feet above the foundation), and visible from a distance of 18 miles. The lighthouse, cylindrical in shape, is painted dark grey and white, as is also the keeper's dwelling attached. Position approximate, lat. 18° 23′ 15″ N., long. 65° 36′ 45″ W.

209.—WEST INDIES.—*Puerto Rico.—West Coast.—Sunken Rock Southward of Jigüero Point.*—This rock—reported by the Commander of the Hamburg West India mail steam-vessel *Lotharingia*, and stated to be locally known as Pelegrino rock—is said to have 10 feet water over it, and to lie about one mile from the nearest shore, with the following bearings:—Jigüero point, N. ½ W.; Cadena Point, S.E. by E. These bearings place Pelegrino rock in lat. 18° 19′ 30″ N., long. 67° 13′ 30″ W.

Note.—Pelegrino rock is not, according to the report discernible in ordinary weather, caution therefore is necessary when navigating in the vicinity. *Variation*, ¼° *E.*

210.—UNITED STATES.—*New York.—Long Island.—Sag Harbour.—Fog-Signal at Cedar Island Lighthouse.*—Established at Cedar island lighthouse, eastern side of entrance to Sag harbour, Gardiner bay:—The signal is a bell, struck by machinery, which, during thick and foggy weather, will give *one* blow at intervals of *twenty seconds.*

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CHARTS, &c., PUBLISHED BY THE HYDROGRAPHIC DEPARTMENT, ADMIRALTY, IN MARCH AND APRIL, 1882.

No.		s.	d.
953	Japan :—Omai-saki to the gulf of Yedo, including Suruga gulf and Sagami-ura	2	6
2854	Gulf of Mexico :—Tampico harbour. Approaches to Veracruz	2	0
494	West Indies :—Martinique—Fort de France harbour. Fort de France (Fort Royal) bay. Cul-de-sac Marin	1	6
242	India, west coast :—Sadashivgad bay and river, with port Karwar...	1	6
270	China sea :—Macclesfield bank	0	6
98	West Indies, Cuba :—Approaches to ports Casilda and Masio, with the adjacent anchorages ...	1	0
1178	England, west coast :—Trevose head to Bull point. (Plan, Morte bay)	1	6
1342	Cochin China :—Phan-rang bay to Tong-king gulf. (Plans, Hué river or Thruong Thien. Touron bay. Phuyen and Cou-mong harbours. Vung-gang bay)...	2	6
887	South America, Magellan strait :—English Crooked, Long and Sea reaches	2	6
97	Plan added. Selwyn bay.		

CHARTS THAT HAVE RECEIVED IMPORTANT CORRECTIONS.

No.	
1179	England, west coast :—Bristol channel.
1452	Bahama islands :—Nassau harbour.
2245	Channel islands :—Alderney harbour.
274	North Polar chart, Atlantic side.
278	North Polar chart, Pacific side.
260	North Polar sea.
2435	North Polar sea :—Mackenzie river to Behring strait.
952	Japan :—Owasi bay to Takamatsu-no-saki.
71c	India, east coast :—Coromandel coast.

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No.

2471 North America, east coast:—New London harbour. Connecticut river.

2375 Australia, north coast:—Torres strait, western channels.

54 Korea:—Port Lazaref. Shin Po anchorage, &c.

2050 England, south coast:—Spithead and approach from the eastward.

2172 North America, west coast:—Behring strait.

OUR OFFICIAL LOG.

INSTRUCTIONS TO EXAMINERS AND NOTICES TO CANDIDATES FOR EXAMINATION FOR FIRST MATES' CERTIFICATES OF COMPETENCY.

Service as Third and Fourth Mate.

Board of Trade, Marine Department, May, 1882.

The Board of Trade have had their attention called to the position of young officers serving as third and fourth mates in the ships of the "Peninsular and Oriental" and other large companies, who under present regulations cannot be examined for certificates of competency as first mate until they have served twelve months at sea in the capacity of second mate or some higher rank. The Board of Trade have therefore decided to accept such service as third or fourth mate to the same extent as second mate's service is accepted to qualify candidates for examination for certificates of competency as first mate. Before, however, a candidate can be allowed to be examined, he must produce satisfactory proofs that he has had charge of a watch for not less than twelve months while serving as such third or fourth mate, and that during the whole of that time he has been in possession of a second mate's certificate of competency.

The Board of Trade also give notice that, with the concurrence of the Lords Commissioners of the Admiralty, they are about to issue a provisional certificate of competency as first mate to any

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officer serving as third or fourth mate, and belonging to the Royal Naval Reserve, who at present becomes disqualified for promotion to the rank of sub-lieutenant in the Reserve after he attains the age of 25 if he has not previously obtained a certificate of competency as first mate.

These provisional certificates will be of two kinds, viz., for "foreign-going sailing ships and steamships," and for "foreign-going steamships," according to the service of the applicant. They will be granted to a candidate who can prove one year's service at sea as third or fourth mate while holding a second mate's certificate, and who passes the usual examination for first mate and pays the usual fee. They will only be available for purposes of the Royal Naval Reserve, and will *not* authorise the owners to go to sea as first mate. They will be exchangeable for the proper formal certificate of first mate, without further payment or examination, on production to the Registrar-General of Seamen of satisfactory proofs that the holder of the provisional certificate has served at sea not less than 12 months in the capacity of third or fourth mate, and that during the whole of that time he has had charge of a watch, and has been in possession of a certificate of competency not below the rank of second mate.

Candidates for provisional certificates must apply to a Mercantile Marine office, fill up the form of application Exn. 2, and pay the usual fee. They must also produce their second mates' certificates of competency, and an authority from the Board of Trade, or the Admiral Superintendent of Royal Naval Reserves, before they will be examined. T. H. Farrer, Secretary.

Thomas Gray, Assistant-Secretary.

Official Inquiries at Home, 1882.

1322. *Langrigg*, barquentine; built at Berwick-on-Tweed, 1864; owned by Mr. W. R. Kelly; tonnage, 181; Whitehaven to Clare Castle; coals; supposed to have foundered at sea. Inquiry held at Whitehaven, April 12, 1882, before Jackson and Fletcher, Justices; Foster and Burney, N.A. No evidence as to cause of loss.

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1325. *Ballina*, s.s. ; built at Barrow in Furness, 1878; owned by Mr. G. T. Pollexfen; tonnage, 170; Liverpool to Ballina; general cargo ; supposed to have foundered at sea. Inquiry held at Liverpool, March 29, 1882, before Rothery, Wreck Commissioner ; Grant, Burney and Merrifield, N.A. Vessel overladen when she left Liverpool. Managing owner condemned in a fine of £150.

1326. *Thessalia*, s.s.; built at Govan, 1855 ; owned by Mr. B. Papayanni and others ; tonnage, 1,205 ; Smyrna to U. K.; general cargo ; abandoned off Cape Sardao, Portugal, February 28, 1882. Inquiry held at Liverpool, April 14, 1882, before Raffles, Judge ; Ward, May and Hallett, N.A. Abandonment justifiable ; the shaft being broken, and the vessel being in an unmanageable and sinking condition.

1328. *Briton*, brig ; built at Maryport, 1838 ; owned by Mr. J. Gaw ; tonnage, 75 ; Portaferry to Whitehaven ; potatoes, &c.; lost off Maryport, February 13, 1882, when loss of life ensued. Inquiry held at Maryport, March 27, 1882, before Rothery, Wreck Commissioner ; Moresby, Murdoch and Parish, N.A. Loss due to vessel having been in collision with a tug. Master of tug to blame for attempting to pass the brig on wrong side.

1329. *Khokand*, barque ; built at Greenock, 1881 ; owned by Mr. W. Crawford ; tonnage, 1,104 ; Hull to San Francisco ; coals; stranded on East Bank, Bexhill, March 23, 1882. Inquiry held at Liverpool, April 15, 1882, before Raffles, Judge ; French and Harland, N.A. Casualty caused through master standing into the land too long. Certificate suspended for six months.

1331. *F. W. B.*, brigantine, and *Gertrude*, s.s. ; the former built at Alloa, 1880 ; owned by Mr. F. W. Baddeley ; tonnage, 192 ; Berbice to London ; sugar ; the latter built at Stockton, 1873 ; owned by Mr. W. F. Robertson ; tonnage, 137 ; Dieppe to London ; ballast. In collision off Southend, March 24, 1882. Inquiry held at Westminster, April 17, 1882, before Rothery, Wreck Commissioner ; Curling and Harland, N.A. Accident due to an insufficient look-out having been kept on board the steamer, for which the master is to blame. He holds no certificate.

1332. *Buckland*, barge, and *R. W. Boyd*, s.s. ; the former built

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at Frindsbury, 1875; owned by Mr. C. Tuff; tonnage, 42; Fulham to Rochester; manure; the latter built at South Shields, 1880; owned by Mr. J. Wilson; tonnage, 840; Sebastopol to Bremerhaven; rye. In collision in the River Thames, March 4, 1882, when the barge was sunk, and loss of life ensued. Inquiry held at Westminster, April 15, 1882, before Rothery, Wreck Commissioner; Powell, Anderson and Hyde, N.A. Casualty caused by the negligent navigation of the waterman in charge of the *R. W. Boyd*; master to blame for giving up charge to so unqualified a person.

1333. *Queen Emma*, brig; built at Quebec, 1866; owned by Mr. E. Griffiths; tonnage, 193; Bull River to Belfast; phosphate rock; abandoned at sea, February 1, 1882. Inquiry held at Liverpool, March 30, 1882, before Rothery, Wreck Commissioner; Vaux and Reeves, N.A. Vessel overladen and unseaworthy. Abandonment somewhat hasty as the vessel was subsequently taken into Fayal.

1336. *Proteus*, ship; built at St. Martin, N.B., 1863; owned by Mr. R. B. Avery; tonnage, 1,195; Penarth to Naples; coals; abandoned at sea, March 2, 1882. Inquiry held at North Shields, April 19, 1882, before Spence and Swan, Justices; Ward and Murdoch, N.A. Ship prematurely abandoned. Master's certificate suspended for twelve months. The vessel was subsequently boarded by the crew of the French ship *Réné* and taken into Palais.

1339. *Lady Dufferin*, built at Quebec, 1872; owned by Mr. J. N. Ward; tonnage, 1,299; Liverpool to Callao; coals; lost on West Chison Cay, Falkland Islands, February 17, 1882. Inquiry held at Liverpool, April 19, 1882, before Raffles, Judge; Parfitt and Anderson, N.A. Casualty due to vessel having been carried out of her course by a strong current not accurately allowed for. Master and mate acquitted of default.

1338. *North Eastern*, s.s.; built at Pallion, 1871; owned by Mr. W. Moran; tonnage, 695; Granton to Copenhagen; coals. Supposed to have foundered at sea. Inquiry held at Hull, April 20, 1882, before Rothery, Wreck Commissioner; Aplin and Castle, N.A. Owing to cargo being improperly stowed, the vessel

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was very crank. Probably foundered in heavy gale which occurred soon after her departure.

1343. *Elaine*, s.s., and *Rocklands*, s.s; the former built at Port Glasgow, 1867; owned by Mr. W. Buchanan; tonnage, 39; Glasgow to Rothesay; passengers. The latter built at Hartlepool, 1881; owned by Mr. R. Hardy and others; tonnage, 602; Bilbao to Glasgow; iron ore; in collision off Gourock Point, March 21, 1882. Inquiry held at Glasgow, April 27, 1882, before Swan and Young, Justices; Hight and Parish, N.A. Master of *Elaine* to blame for disregarding regulations for preventing collisions. Certificate suspended for three months.

1344. *Koomar*, barque; built at Bath, U.S.A., 1858; owned by Mr. T. Emerson; tonnage, 1,188; Quebec to Plymouth; timber; supposed to have foundered at sea. Inquiry held at Westminter, May 2, 1882, before Rothery, Wreck Commissioner. Powell and Comyn, N.A. Ship seaworthy when leaving Quebec. Probably foundered in gale of wind of November last.

1345. *Pelton*, s.s.; built at Low Walker, 1876; owned by Mr. J. Reay; tonnage, 517; Newport to Havre; coals; foundered in Bristol Channel, March 26, 1882, when loss of life ensued. Inquiry held at Westminster, April 25, 1882, before Rothery, Wreck Commissioner; Forster and Moresby, N.A. Loss due to vessel falling over on her side by reason of having a large quantity of coals stowed on the bridge deck. Master and owner to blame for allowing it to be so stowed.

1346. *Famenoth*, ship; built at Govan, 1876; owned by Mr. G. M. Cooke and others; tonnage, 983; London to Otago; general cargo and passengers; stranded on the Pan Sand, off Whitstable, March 27, 1882, when loss of life ensued. Inquiry held at Westminster, April 28, 1882, before Rothery, Wreck Commissioner; Pickard, Ward and Wilson, N.A. Casualty caused by the default of the pilot in charge (drowned) in keeping the vessel on improper courses. Master to blame for neglecting to send one of the tugs in attendance to the assistance of the men who were away in the boat. Certificate suspended for three months.

1348. *Alexandra*, barque; built at Midford, Mass., 1836; owned by Captain H. Palmer; tonnage, 382; Maryport to Doboy;

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ballast; abandoned at sea, February 21, 1882. Inquiry held at Maryport, April 5, 1882, before Senhouse and Addison, Justices; Beasley and Hyde, N.A. Abandonment justifiable, vessel having sprung a very serious leak.

1351. *Ben Venue*, s.s.; built at Sunderland, 1877; owned by Mr. S. A. Morrison; tonnage, 988; Cardiff to Port Said; coals; stranded on Jaseur Reef, coast of Morocco, February 22, 1882. Inquiry held at North Shields, May 9, 1882, before Spence and Jackson, Justices; French and Murdoch, N.A. Master guilty of *negligent* navigation, running in too close to the land, and *neglecting to* verify his position by cross bearings. Reprimanded.

1352. *City of London*, s.s.; built at Glasgow, 1863; owned by the Steamship City of London Company, Limited; tonnage, 1,880; London to New York; general cargo; supposed to have foundered at sea. Inquiry held at Liverpool, May 11, 1882, before Raffles, Stip. Mag.; Grant, N.A. and Hallett, E.A. Ship seaworthy when leaving London and not overladen. No evidence before Court as to cause of loss.

1353. *Gipsy Chief*, brigantine; built at Plymouth, 1871; owned by Mr. C. Gent; tonnage, 173; lost on the Coast of Brazil, February 1, 1881. Inquiry held at Plymouth, May 11, 1882, before Rothery, Wreck Commissioner; Beasley and Rees, N.A. Loss attributable to negligent navigation on the part of the master in standing into the land too long, instead of going about with the vessel's head off shore. Certificate suspended for six months; recommended for one as mate during that time.

Official Inquiries Abroad.

1323. *Wakatu*, schooner; lost on Toms Rock, Cook Strait, January 6, 1882. Inquiry held at Wellington, N.Z., January 11, 1882. Second mate to blame for allowing vessel to run off her course. Certificate suspended for six months.

1324. *Poonah*, ship; stranded in Table Bay, February 17, 1882. Inquiry held at Cape Town, March 1, 1882. Master committed an error of judgment in running too close in shore.

1327. *Maggie Horton*, barque; lost on Cherokee Sound, Abaco,

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March 1, 1882. Inquiry held at New Providence, Bahamas, March 8, 1882. Master justified in beaching his ship in order to save life.

1330. *Active*, sloop; lost on Nassau Bar, December 17, 1881. Inquiry held at New Providence, January 23, 1882. Casualty due to the master crossing the bar at a dangerous time.

1334. *Queen of Ceylon*, barque; lost on the Beach near Durban, March 3, 1882. Inquiry held at Durban, March 15, 1882. Loss due to the chains parting. Master and mate free from blame.

1335. *John G. Hall*, barque; stranded off South Point Lighthouse, Barbadoes, March 4, 1882. Inquiry held at Barbadoes, March 28, 1882. Accident due to careless navigation. Master suspended for three months. Mate reprimanded.

1339. *Boomerang*, s.s., *Atlanta* schooner. In collision in Port Jackson, December 23, 1881. Inquiry held at Sydney, February 15, 1882. Master of *Boomerang* to blame for breach of regulations for preventing collisions. Reprimanded and cautioned.

1340. *Fiona*, s.s.; lost near Seal Rock Point, January 29, 1882. Inquiry held at Sydney, February 13, 1882. Master to blame for mistaking lights. Certificate suspended for three months.

1341. *Bahama*, s.s.; foundered at sea, February 11, 1882. Inquiry held at Quebec, March 6, 1882. Disaster due to mismanagement on the part of the officer in charge.

1342. *Robert Jones;* abandoned at sea, January 7, 1882. Inquiry held at Cape Town, March 15, 1882. Abandonment justifiable.

1347. *Norval;* burnt and abandoned at sea, March 4, 1882. Inquiry held at Honolulu, April 3, 1882. Abandonment justifiable. Master's conduct most praiseworthy.

1349. *City of Cashmere*, ship; lost on Ninety Mile Beach, New Zealand, January 14, 1882. Inquiry held at Timaru, N.Z., February 9, 1882. Loss due to chains parting and vessel drifting on the beach.

1350. *Constantine*, s.s.; stranded on North Point of Bornholm Island, April 13, 1882. Naval Court held at Copenhagen, April 27, 1882. Casualty due to thick weather and the set of the current.

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THE

NAUTICAL MAGAZINE

FIFTY-FIRST YEAR.

VOLUME LI.—No. VII.

JULY, 1882.

UNSEAWORTHY SHIPS AND SHIP SURVEYING.

A SERIES of articles, said to be written by "A Seafarer," has recently appeared in the *Daily Telegraph* upon the subject of unseaworthy ships and ship surveying. The writer has partly studied his subject at the Shipwrights' Company's late exhibition of models, and has visited a number of shipbuilding establishments, and made enquiries among the workmen, taking care, as he candidly informs us, to move off when the manager appeared in sight; and he has come to the conclusion that there is sufficient bad and dishonest material and work put into new ships of the present day to fully account for any number of losses at sea. The modern steamship, he tells us, is "a false and frail contrivance doctored up and smothered over with paint." Ships are built whose "iron frames and whose plates are fit for nothing but to be branded with the word 'murder,' so that when the metal fragments come ashore the beholder may know for what purpose they were designed." Without stopping to enquire how such metal fragments are to come ashore, we pass on to his description of the way in which these bad plates "and frames which are only fit to be sold for old iron" are put together. "The plates,"

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we are told, "will be wrenched and warped into any kind of abominable fit by the rivets, and the whole structure and the lives of people who commit themselves to it will be made to depend upon points which no honest shipwright would dream of reckoning as factors in the binding and holding powers of the fabric." It is not exceptional cases which are thus described, but "a serious proportion of the ships which are now built . . . . innumerable iron ships which are month after month slipped along the greased ways into that ocean whose bottom they are bound to sound in due course."

A reason for all this is found by "A Seafarer" in the fact that the ship surveying of the present day, whether by Lloyd's or the Board of Trade surveyors, is a sham, the shipbuilder who wishes to get bad work passed has only to take care that the surveyor sees the ship "through no other medium than a bottle of champagne." The surveyors "deliberately ignore their most grave and great responsibilities, and lure the sailor by what are absolutely false representations into committing his life to ships utterly unfitted in a score of respects well-known to the surveyor, to attempt the voyages they are manufactured to undertake."

All this when put into plain language means, that as regards both material and workmanship, the iron ship of the present day is altogether bad, and surveyors are utterly untrustworthy.

The first question which naturally suggests itself is, to what extent is "A Seafarer" competent to form an opinion upon iron ships and shipbuilding which is worthy of being published in a prominent London daily paper. His acquaintance with the subject is obviously of but recent date, and of a very superficial character, for he naively tells us how an iron ship in frame struck him as having "more the look of a gigantic umbrella than of a fabric that was to give battle to roaring gales and thunderous seas," and in another place he remarks upon "the flimsy metal skeletons which, when plated with thin sheets of iron and loaded with the dead weight of coal and freight and engines, are to confront and give battle to the terrible sea." We suppose that the majority of unprofessional visitors to shipyards are, when for the

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first time they see the frame of an iron ship, similarly impressed with the lightness, one might almost say airiness, of the structure, and its apparent inadequacy to the work which it is intended to do; the real truth being, that the *frame* of an iron ship is, as compared with the strains to which it is liable, the strongest part of the vessel. "A Seafarer," however, in search of sensational details, proceeded to ask questions of all and sundry, and appears to have got what to him were satisfactory answers. For the moderate outlay of a shilling, he obtained the opinion of a chance workman upon the strength of iron frames, the nature of the strains to which they are liable, the relative merits of punched and drilled holes, &c.; on all of which questions the average workman is about as competent to form an opinion as he is to write high falutin articles for a London daily paper. On the strength of the valuable knowledge so obtained, "A Seafarer" is able to vary his highly spiced denunciation with some technical references calculated to impress the unprofessional reader with a sense of the writer's ability to discuss the subject in hand. Thus he exposes the foul enormities of "laminated frames, whose ends, by not butting on the keel bar leave the garboard strake plate to bear the strain in a sea way." Why the ends of frames should butt on the keel bar, how many ever do so butt, and what is the nature of strains brought upon the garboard strake for want of such butting, are all questions to which the intelligent British workman will no doubt for another shilling fee, give better answers than can be found in any current treatise on naval architecture. We regard it as to some extent fortunate that "A Seafarer" has thus ventured into technicalities, because the meaningless nonsense which we have quoted, indicates sufficiently clearly to any one in the least degree conversant with the details of iron shipbuilding that the writer has no real knowledge of the subject, and that like some sensational enthusiasts who have previously run a muck against the Mercantile Marine, he appears to have been the victim of misplaced confidence. The intelligent workman whose aid he sought, no doubt complacently pocketed his shilling, feeling morally satisfied that he had given "A Seafarer" plenty of information for his money.

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Able writers in both the *Shipping Gazette* and *Engineering* have remarked at some length upon the injustice and untruth of the charges which are made against the whole body of professional marine surveyors; the very comprehensiveness of those charges affords we think a sufficient refutation of them. If these sensational denunciations were in any sense true, our Mercantile Marine would be in a bad case indeed, and without remedy. What would be the use of any system or change of system of inspection, if the class of men to whom its practical working must be entrusted are utterly dishonest and corrupt.

There is, we regret to say, bad material put into ships now as there always has been; there is bad work, due sometimes to the greed of the shipbuilder, but as often to the carelessness or dishonesty of workmen, such probably, as he by whom "A Seafarer" was coached, but what evidence can be produced to prove that a large proportion of the iron ships lost, are lost through defects either in material or workmanship, such as the *Daily Telegraph* writer has described. Of the losses of iron ships referred to by name, there is absolutely no reason to believe that any one was lost as a consequence of her having been dishonestly built. There are real evils enough to grapple with: overloading, bad stowage, the shifting of grain and other cargoes, insufficient protection of deck openings, are all evils of greater importance than those brought into such undue prominence by the writer in the *Daily Telegraph*. The forms of ships as affecting their seaworthiness is also a large question. There can be no doubt that some new steamers are built with such full ends that they cannot be handled with safety in a North Atlantic gale. Others are of such proportions that in homeward voyages with light homogeneous cargo, they have so small a metacentric height, that a comparatively trifling shifting of the cargo becomes a source of danger. How to deal with such questions as these in connection with marine insurance is the problem of the future for Lloyd's; the possibility of dealing with them in such a manner as to avoid crushing out proper and judicious freedom for development is the problem before the Board of Trade. By branding manufacturers of ship-iron, shipbuilders, and marine surveyors as a body of murderous villains banded together

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in a foul conspiracy to produce ships which will not swim, the writer in the *Daily Telegraph* is but raising a cloud of dust through which the real evils cannot be seen, and under cover of which real culprits may escape detection.

ATLANTIC WEATHER.

THE North Atlantic is necessarily a part of the world in which a British seaman must be interested above all others, not merely from the fact that its waters wash the shores of his home, nor yet because it has to be traversed by him to a much greater extent than any other ocean, but taking it as a whole the winds he there encounters are of a more variable nature both in direction and force than elsewhere; in one passage a vessel may experience just the winds favourable to shaping a course, whilst on her next passage even at the same season the winds may be altogether as unfavourable, and a vessel may have to beat against a head wind for weeks together. In spite of the enormous amount of trade which is carried on in the Atlantic by English shipping and indeed by shipping of all nations, very little is known of the existing meteorological conditions. A seaman, say leaving England, cannot calculate with any amount of certainty from what direction he will get the wind in latitudes to the north of the N.E. trades, nor can he when overtaken by a gale of the ordinary type determine even approximately the distance he is from the central area of disturbance, still less does he know when fully in the gale what strength of wind is yet in store for him. But to come nearer home, given certain conditions of weather on the Atlantic coasts of the British Islands, how little is known as to what is going on a few hundred miles from our shores; it often happens that with a steadily rising barometer and the finest of weather at our westernmost stations a violent gale is blowing at less than 500 miles distant and is travelling rapidly towards us. Doubtless a knowledge of such conditions would be of the highest possible value to the commander of a

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vessel starting on her outward passage, and if by a proper study of the weather on our coasts, in connexion with that existing out in the Atlantic, the system of storm warnings could be improved, this surely would be a direct gain to our seafaring population.

If the appeal made by the Meteorological Council for daily observations in the North Atlantic from August 1st, 1882, to August 31st, 1883, a notice of which was printed in the *Nautical Magazine* for May, meets with a hearty response from those navigating this ocean, doubtless much will be done towards the elucidation of many a meteorological problem, and light will be thrown upon some of the vexed questions with which the subject is at present surrounded.

This synchronous method of charting is not new, but is similar to that which has been undertaken before by the same scientific body as well as in the Meteorological Department, by Admiral Fitz Roy (1859), Le Verrier, Hoffmeyer, Neumayer, the United States Weather Bureau, and on a much smaller scale by many others, but the Meteorological Council state clearly that in all previous attempts the observations collected have been too few to produce satisfactory results, and the success of the extensive discussion which they are now undertaking depends solely upon the spirit with which the proposal is received by commanders and others engaged in the Atlantic trade. It is not possible to have too many observers, and even if every vessel afloat lends a helping hand there must often be large tracts of the ocean without an observer, but provided all will contribute the little which is required of them, the work must yield important results and add much to our knowledge of Atlantic weather, as well as affording a clue to the weather changes of the British islands. The observations asked for are so simple as to leave no reasonable excuse for abstaining from the required co-operation.

The method of discussion followed in this style of work is to make a chart for at least each day, either for the same moment of Greenwich time or for a fixed hour of ship's time; if for Greenwich time, a view of the weather is obtained for the same instant over the whole area embraced, so that the observations are purely synchronous; but if for a fixed hour of ship's time, say

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noon—of course the time varies with the longitude and the observation charted—for say, New York is about five hours later than that for London; but whether Greenwich or ship's time is adopted the plan is to enter on a chart at the position of each ship, the wind, direction and force, reading of barometer (if given), and other data—so that the closer together the observations from these floating observatories the greater the certainty that a true picture of the whole of the weather existing has been obtained, and similarly, the greater the ease and certainty in tracing the various changes of weather which are almost invariably propagated from the westward in an easterly direction. Again, the closer the vessels observing are together the greater the exactness in determining the shape and size of the depressions or storm centres and the action of the wind with regard to the centre of disturbance. It is from such a system of observations at sea that deductions proving or disproving the theory of indraft must be made, since such deductions from land observations cannot be received with anything like the same amount of confidence, owing to friction and other interfering causes which play so prominent a part in disturbing the correct determination of wind directions on shore.

The series of charts proposed will enable a navigator to see the conditions of weather which he was experiencing on any day in any part of the North Atlantic, and also to see the different kinds of weather which at the same time were being experienced in his immediate neighbourhood as well as at a distance from him; he will be able to see how the best course could have been shaped and how a gale might have been avoided or turned to good account. To vessels bound in opposite directions the Atlantic weather at the same time and at the same spot appears to be of a very different character, for instance, a vessel outward bound to America meets the travelling wind-systems as they speed at an average rate of about 20 miles per hour on their course to the eastward, so that both the progress of the vessel and the progress of the weather systems are favourable to a rapid series of changes, consequently, it often happens that an outward bound vessel meets with a succession of violent gales, one no sooner lulling than another is fallen in with; but with a vessel homeward bound from

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America the conditions are very different, she is travelling with the wind systems and though they are generally overtaking her by reason of their greater rate of progress, yet a vessel keeps within their influence for a much greater time, and travelling with them, she comes under the influence of far fewer than the outward-bounder who is meeting these systems of weather.

It sometimes happens that a homeward-bounder, steaming quickly to the eastward, experiences a south-westerly wind and a rising barometer; in such a case she is outstripping a centre of disturbance, or in other words she is travelling faster to the eastward than the wind system in which she is situated, and is consequently cutting out for herself a higher barometer reading and better weather; if the vessel were to heave-to she would find her barometer would fall, and if she were bound to the westward the barometer with the same wind would be falling briskly. A steamer bound to the eastward may also overtake and pass through a wind system, experiencing first a north-westerly gale with a falling barometer and subsequently a south-westerly gale with a rising barometer; the explanation of this is merely that the vessel is travelling faster to the eastward than the weather system, and if she were to heave-to for a short time or to travel less quickly the gale would outstrip her. In short it may be said that a vessel outward bound to America experiences much more frequent changes of weather and her barometer will rise and fall with greater rapidity than with a homeward-bounder.

The limits of the trade wind and any change which takes place from day to day throughout the year is also shown up in the most striking manner, as well as the locality in which the trade is strongest, and where the direction is the most suitable for the desired passage. During the greater part of the year, at least, the N.E. trade blows only from a north-easterly direction on the eastern side of the Atlantic, and is generally strongest in rather close proximity to the African coast, whereas in mid-ocean the trade has decidedly more easting in its direction, and on the western side of the Atlantic, that is, on the side adjacent to the American coast, it blows generally from the south-eastward. Doubtless this is known to most navigators and is taken advantage

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of, but probably not to the extent which it might be, and the reason of this difference in the direction of the trade is probably only but half realized. The synchronous charts published by the Meteorological Council for the month of August, 1873, exhibit this in a most striking manner and show that in that month the whole difference is due to an area of high barometer readings being situated in Mid-Atlantic, which causes a circulation of the air in agreement with the movement of watch hands, and in a contrary direction to that which exists round an area of low barometer readings.

There are other advantages to be obtained from a series of synchronous and synoptic charts, they enable mean results to be worked out in a much more satisfactory manner than that generally followed in the discussion of sea observations. The method usually adopted in the construction of wind charts, or charts of any other element over the ocean, is to collect all available observations made over a fixed area, say a space comprising 5° of latitude and 5° of longitude, and to combine all such observations in this space for obtaining a mean result. The same is done for other spaces and the results thus obtained are treated as comparable. It will be seen that on this principle the means of any two adjacent spaces may be comprised of observations made at entirely different times and under very different conditions. Indeed the means are obtained from a certain number of snatches of observations; in one space an observation may be recorded during a gale with a low barometer, whilst in the adjacent space possibly there was no record of a gale at all. It will be evident that the observations must extend over a considerable period of time to eliminate the differences introduced by such a system. On the other hand, with a series of synchronous charts a value can be estimated for each day and for each space for which it is wished to give a mean value, so that in point of fact any two adjacent means would be as comparable as those deduced in the ordinary way for say London and Liverpool.

The period for which it is proposed to give these charts is the same as that for which special international circumpolar meteorological observations are to be made, and the opportunity

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afforded of connecting the Atlantic weather with that of the Polar regions, renders it the more desirable that an increased effort should be made to render the undertaking a success.

When we come to consider the exceptional character so forcibly presented this year, not only in the enormous quantity of ice, but also in the size of the bergs which are floating down from the Arctic regions, we are bound to admit that we are at a loss to account for such exceptional conditions, and we must be content to continue in ignorance while our knowledge of the regions from which these floating masses are liberated remains so limited and of such a fragmentary character. It seems fairly safe to reason both from the vast masses liberated, and from the very early period this year at which ice was met with by vessels traversing the North Atlantic, that the mild weather which was so marked a feature in the meteorological conditions of the British Islands during the winter which has just passed, must have extended to a much higher latitude than our own. C. H.

CHANNEL NAVIGATION AND RULE OF THE ROAD AT SEA.

IN our number for May last is an article on "Channel Navigation," written by a valued correspondent under the initials of "E. B." In the present number, under the initials "P. H. C.," is a letter from a correspondent who has written and lectured on the subject of the Rule of the Road at Sea probably as much and as often as any professional man. Our correspondent "P. H. C." takes exception to some of the *dicta* of our correspondent "E. B." Our desire, like that of both our correspondents, is that collisions should be avoided, and we have always put before our readers that the best, indeed the only way to avoid collision, is to adhere to the Rule of the Road. In the first place, the Rule of the Road enjoins caution throughout, and in no way requires or encourages ships to approach each other; and equally it does not require any alteration in the course of ships where, so long as each ship

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keeps her course, there is no danger of collision: but where there is danger of collision if both ships keep their course the rule requires that one of them shall keep her course and the other shall keep out of the way. The rules also require that every steamship when approaching another ship so as to involve risk of collision shall slacken her speed and stop and reverse if necessary. And that every ship, whether steam or sailing, shall go at a moderate speed in fog, mist, or falling snow. These principles are the fundamental principles underlying the whole rules. If any one of these principles is lost sight of an understanding of the rules is impossible.

We do not read the communication from our correspondent "E. B.," which appeared in our May number, as in any way losing sight of these principles. Our correspondent "P. H. C.," takes exception to one passage in the article of "E. B.," and on that sends us his letter. We think, however, that "P. H. C." has misunderstood "E. B." The point urged by "E. B." is very small, but its wisdom is great, and it does not violate any principle of the Steering and Sailing Rules. It does not, as "P. H. C." seems to think it does, advise one of two ships to alter her course when she is required by the rules to keep her course. It seems to us written to enforce the fact that in a part of the channel large steamers run in a well-known course of very nearly a straight line—*i.e.*, "from four miles off Tuskar to the entrance of Queenstown;" and it advises sailing ships to keep away from that straight line in that channel. If it means this the advice is sound. If certain words are quoted from it without the context it would appear to advise all masters of sailing ships to perform some manœuvre in the presence of a steamer; but this would be a violation of the rules, and moreover, is not intended; because the words which follow enforce the words which go before, when they say that "it is probably known to all seamen exactly what course nearly all steamers take, or should take, *in our channel.*" To keep as much as possible out of the well-known tracks of steamers in the channel is the point enforced, and is very sound advice to the master of a sailing ship. To keep in the tracks of steamers in the channel, and then begin to manœuvre when you see a steamer approaching, is not the point enforced,

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and if it were it would be folly in the face of the rule which throws on the steamer the duty of getting out of the way, and on the sailing ship the duty of keeping her course, so that the steamer may know exactly what to do to avoid danger when crossing the course of the sailing ship would be dangerous. In reality, therefore, our two expert contributors are really at one in what they would enforce, that is to say, obedience to the rules whatever they are, and neither of them could intentionally write anything which would lead a master mariner to believe that safety is to be found in disobeying rules. It is obvious that if all parties act on fully accepted rules, greater safety must result in cases where the rules apply, than if the master of a sailing ship adopted the original but eccentric idea that he is at liberty to execute manœuvres wholly unexpected by, and wholly unintelligible to, the master of a steamer who is trying to keep out of the way. The letter of "P. H. C.," in calling attention to the illegality of such a proceeding is indeed valuable as coming from him.

When we step from the above matter of hard fact, that is to say from requirements of a rule, to a matter involving professional opinion, we find in this case as we find in most, that two sailors very rarely agree on all points. In fact if there be any professional men who seem more prone than others to differ amongst themselves on any set of propositions, they are sailors on questions affecting ships, navigation, tonnage, freeboard, and so forth. But we think we are safe in saying that the recorded cases and statistics tend to show that collision is usually brought about by inefficient look-out, by a ship altering her course improperly, and often by doing so before she has really made out the colour of the light she sees.

It is satisfactory to our readers to find that two such authorities as "P. H. C." and Mr. Thomas Gray, are at last at one on many vital points.

(1.) Mr. Gray says, p. 36 of his book on the Rule of the Road, "On seeing a light"—that "the distance, direction and speed of the ship showing it are all unknown," to the ship seeing it, —therefore "be careful not to act in a hurry on seeing a light, but watch it for a while, so as to be able to act with certainty and in good time when you have to act."

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"P. H. C." now says after a careful analysis of collision cases, he finds that a "large proportion" take place, "after one or both ships had altered course to a doubtful light."

(2.) "P. H. C." tells us "that a larger proportion of collisions take place where the helm used was port-helm to a green light, or starboard-helm to a red light." Mr. Gray in his book, page 84, says, "I know that if I port my helm to a green light anywhere a-head, or anywhere nearly a-head, I am very likely to run into it."

(3.) "P. H. C." tells us that our ancestors would have said, "Never starboard to a *red* light; if it is your duty to give way, port at once, and use no other helm. Never port to a green light; if you have the right of way, don't insist on it, but use starboard-helm, and no other if you have the least doubt." Mr. Gray says in his book (it was published in 1878), "Never forget that if you port to a green light a-head or on your port-bow, or starboard to a red light a-head, or on your starboard-bow, *you are doing your best to get into collision.*"

In 1 and 2 "P. H. C." and Mr. Gray appear to be altogether at one; whereas in 3, they are evidently both working on the same idea practically; and "P. H. C." tells the sailor not only what not to do (where he is right), but what to do (where he is wrong); whereas Mr. Gray warns him what may be the result of doing certain things.

It appears that both of our correspondents "P. H. C." and "E. B." think that the rules can be altered with advantage. If they will both kindly send us their proposed rules we will print them side by side, with our remarks on them; and we shall only be too glad if we find that doctors will not differ. For the present we only now have to note the veneration of "P. H. C." for "our ancestors." There *was*, it seems, a good time when men were wise and good, and women fair and virtuous, and sailors and other technical people clear and unanimous on vital points. How sad it is that such a time never "is," but always "was." We appear always to be living in an age when, according to the voice of the reformer, good advice is rejected, the unreasoning and the obstinate have their way and sense and reason go without regard. No sooner, however, does the "is" become "was" than

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we discover that the golden age has faded, and with "our ancestors" "was" the good, the right, the true.

It is difficult to say with certainty what our ancestors would have said, if they had first thought about something that never occurred to them: but, giving them credit for common sense, we may be certain that if they were also as wise as "P. H. C." thinks, they would have taken what they deemed to be the best available advice. In this respect, if in no other, the present generation resemble our "ancestors," they have taken the best advice, not only in this country, but in every maritime country in the world, and have acted on it, and embodied it in rules that are clear and safe.

Whatever our ancestors might have made, our law makers of the present day have not seen their way to making a rule requiring each of two crossing steamers to try to pass under the stern of the other. Our ancestors might have done what is suggested so far as to say "never starboard to a red light: if it is your duty to give way to it, port at once and use no other helm," and if they had done so they would have been giving advice which would have been sound in the case shown in Fig. 1,

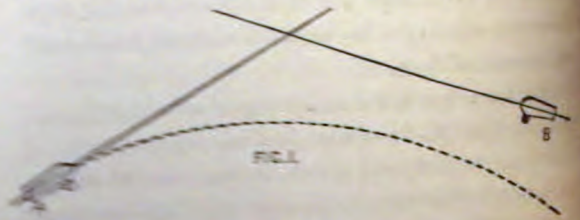

FIG. 1.

but exceedingly foolish in the case shown in Fig. 2.

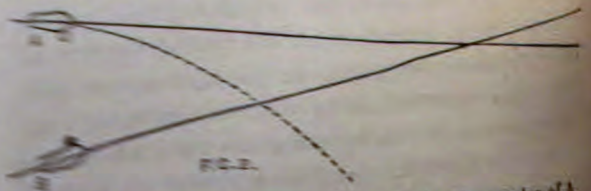

FIG. 2.

Our ancestors having however inculcated into the master of A, Fig. 1, that he is to port to the red light of B, are supposed to

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have been wise enough to say to B "and you B, if you have the *right* of way don't insist on it, but use starboard-helm and no other if you have the least doubt." Therefore, while A is to port to B's red light, their great wisdom is supposed to say to B, and "You B starboard to A's green light"—behold the result :—

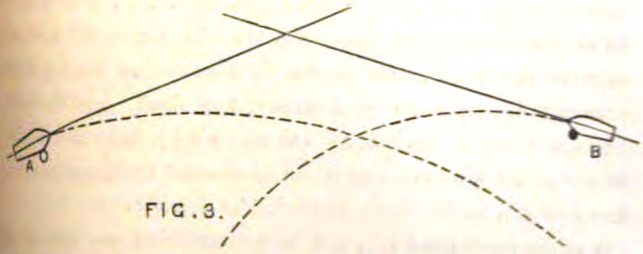

FIG. 3.

It is surely better to require B to keep her course, while A ports.

In fact, our ancestors required, as far as the circumstances permitted, one vessel to keep out of the way, and the other not to alter her course to get into the way. The present rules do the same. The principle is alike throughout. Those sailors, if there be any, who imagine that the rules encourage one ship to get into the way of the other, and those who would endeavour to persuade the "holding-on" ship not to hold on when required to do so by the rules, are in the position of persons giving advice which is not only misleading, but—seeing that it is certain to put the ship following it, in the wrong in a court of law, and is likely to lead to loss of life—dangerous in the last degree.

WRECKED ON THE SUNDERBUNDS.

A YARN FOR THE BOYS.

To the Editor of the "Nautical Magazine."

SIR,—Your readers are not likely to have much sympathy with Dr. Johnson's definition of a ship as "a floating prison with the chance of being drowned," being probably rather of the way of thinking of the mess-mate of a certain Bill, who was invited to "thank Providence that you and I are sailors." But such readers

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we discover that the golden age has faded, and with "our ancestors" "was" the good, the right, the true.

It is difficult to say with certainty what our ancestors would have said, if they had first thought about something that never occurred to them: but, giving them credit for common sense, we may be certain that if they were also as wise as "P. H. C." thinks, they would have taken what they deemed to be the best available advice. In this respect, if in no other, the present generation resemble our "ancestors," they have taken the best advice, not only in this country, but in every maritime country in the world, and have acted on it, and embodied it in rules that are clear and safe.

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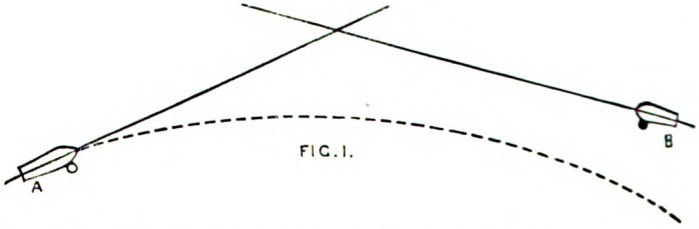

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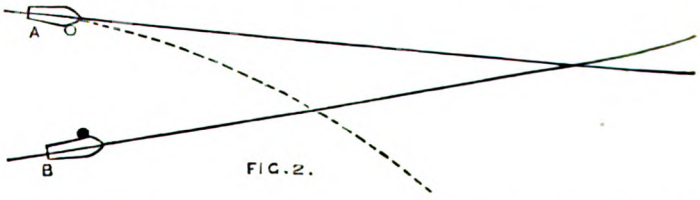

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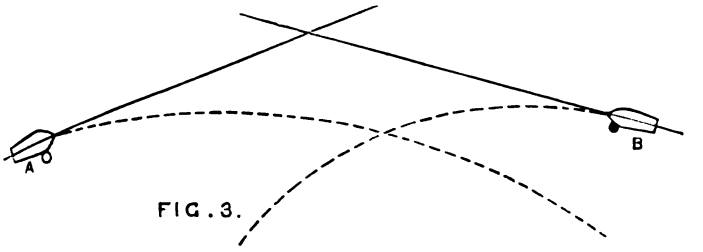

FIG. 3.

It is surely better to require B to keep her course, while A ports.

In fact, our ancestors required, as far as the circumstances permitted, one vessel to keep out of the way, and the other not to alter her course to get into the way. The present rules do the same. The principle is alike throughout. Those sailors, if there be any, who imagine that the rules encourage one ship to get into the way of the other, and those who would endeavour to persuade the "holding-on" ship not to hold on when required to do so by the rules, are in the position of persons giving advice which is not only misleading, but—seeing that it is certain to put the ship following it, in the wrong in a court of law, and is likely to lead to loss of life—dangerous in the last degree.

WRECKED ON THE SUNDERBUNDS.

A YARN FOR THE BOYS.

To the Editor of the "Nautical Magazine."

SIR,—Your readers are not likely to have much sympathy with Dr. Johnson's definition of a ship as "a floating prison with the chance of being drowned," being probably rather of the way of thinking of the mess-mate of a certain Bill, who was invited to "thank Providence that you and I are sailors." But such readers

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may be interested in the following extracts from the letter of a lad of 19, in regard to whose nautical status it may be sufficient to explain that in the Calcutta Pilot Service each pilot is attended and assisted by a leadsman, and that it was in the latter capacity that the youth in question had the subjoined experience:—"On Saturday," he writes, "I went on board the . . . . in attendance on the pilot, and we left Calcutta in tow of a tug. We were the only two Europeans. On Sunday night we cast off the tug about sixteen miles from the pilot station, and slowly beat down the Eastern Channel against an adverse wind; but on Monday afternoon the wind and tide set us up Channel again, and a squall drove us still further back, when, just as darkness was setting in, one of the yards got adrift, and in the confusion we went on to Saugor Sand, and began to bump our very hearts out. The vessel having just come out of dock, and everything having been thrown on board at the last moment, we could not find any blue lights or rockets, and remained all night without being able to make any distress signals. Three-quarters of an hour after we struck we tried to launch all the boats and place the passengers, and as many of the crew as we could, in them; but the first boat was smashed in lowering, and two men killed. The second boat, however, was lowered successfully and, with its occupants, subsequently reached Calcutta.

"We must have gradually bumped right across Saugor Sand during the night—(such a night, blowing hard, yards and masts tumbling about, natives crying and praying!)—for on Tuesday morning at 10 a.m. we were in six fathoms; so we anchored in pretty smooth water and waited for assistance. At grey dawn we had seen a steamer and two ships go by a long way off, but there was hope that they had seen us and would send help. We had now on board about twenty-five native passengers and twelve of the crew, and we set to work to launch the remaining boat, a small gig. It was lying on deck among spars and wreckage, but after some hard work we got it into the water and passed it astern. There was not room for all, but some of us were unwilling to leave the ship with helpless people in her, and tried to persuade the men to go on pumping; but they were all much exhausted,

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and about noon all except four men got into this last boat and left us alone with the poor native passengers.

"Well! we helped them to make rafts out of hen-coops, planks, chairs, &c., and gave them food and advice as to what to do when the time came to take to the water; and then we waited and watched the ship gradually sink. We tried to slip the anchor and drift ashore, but not having enough men, and heavy seas coming over every minute, we could not manage it. At 7 p.m. she took a final plunge and next minute, leaping clear of the eddy, I found myself struggling in the water. I struck out and got on a spar, and then took off all my clothes as I found they were dragging me down. I shouted for my superior officer and the next moment he was hanging on alongside of me. Soon after we made out a large flat thing floating by; both struck out for it and got safely on top, when we found it was the entire roof of the forward deck-house. It had evidently been burst off in the final heave; it was about 6 feet broad by 12 long, in fact a magnificent raft; and finding two pieces of iron sticking up on it we were able to cling on safely. Nobody else turned up although we heard voices and cries, but in the dark what could we do? Gradually all became quiet and we were alone with the wind and waves. There was a very heavy sea running and every now and then a big one would go smack over us, spinning us from one end of our raft to the other, and then we would crawl back again, vomiting sea water; and it was so cold that for a little while I did not care whether I went or not; but that feeling did not last long, and when the moon rose we felt a little more cheerful and talked of home and prayed for strength and help.

"All Tuesday night we drifted, but on Wednesday about 8 a.m. we sighted land, and soon after we were washed off our raft in heavy breakers, and after a great deal of struggling and swimming we were on firm, dry sand.

"I was terribly bruised about, and had some dreadful looking sores on my elbows, legs, shoulders, breast and back; in fact wherever there was a bony projection it had been skinned. My chief had fared somewhat better, as his life-belt had saved him from bruises, and he had also a pair of trousers and a banian.

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We did not know where we were, but thought if we walked to the northward we might find something or somebody; and after having done so from 9 a.m. until about 4.30 p.m. in the blazing sun (I without a vestige of clothing), and after swimming three creeks, without being eaten by crocodiles, we at last caught sight of a refuge house.

"The Ganges, as you know, empties itself by many mouths, of which the Hooghly is one, and the delta formed by all the streams is very low, marshy, jungle-land, infested with snakes, tigers and other wild animals, and with malaria. These 'Sunderbunds' are always a lee-shore for ships coming in, and make a sort of huge net into which all the wreckage of this part of the world ultimately finds its way. Along the sea faces 'refuges' are placed purposely for cases such as ours. They are very much like English dove-cotes, raised about 16 feet from the ground on strong piles, and approached by a ladder and trap door in the floor, and have a mast and white basket to catch the eye, overhead. Every-half year they are replenished with water, biscuit, tinned meats, blankets, clothes and everything useful down to charts, and between whiles and as regularly some one 'loots' them. We were fortunate enough to find about 30 biscuits and half a tank of water, although everything else had disappeared, but the first taste of that water was better than the best wine in the world. Then we bathed our sores, and, discussing what next, determined to remain there until they found us, for we knew that so soon as we were missed they would send down to search all the houses and as much of the sea-face as possible. So on Wednesday night we lay down on the bare boards, as close to one another as possible and tried to sleep; but the cold and the rain came in at every corner, and the rats came too; and to crown all, my companion grew delirious for a while. In the early morning we went down to the sea-shore to sit and watch for smoke and see the breakers roll in, and when the sea got up we returned and munched our half-biscuit and drank our allowance of water, and then all through the day we could do nothing but sit and talk to one another. In the cool of the evening we went down again to get some fresh air and then returned to eat our

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meal and try to rest. I thought about all my past life, and the dear old home and folks; and prayed God to assist us in our need; and I trust it has made a better fellow of me. I am sure the Almighty would not have brought us safely through it all but for a wise purpose, and it has been a lesson to me which with God's help I trust never to forget.

"This went on for six days, every day our hopes going down a peg; my chief, however, getting well and strong, but I gradually weaker, until at last I could not even eat, and did not care to move. I believe that for four and twenty hours we had a hungry tiger in attendance, who would have made short work of us if we had moved. My superior officer did all in his power to make me rouse up, but I was too far gone to obey him, and once again I felt as if I really did not care whether I was saved or not; once on the raft you see and once here.

"On the evening of the sixth day they found us. I thought I heard voices, and my chief went to the look-out hole, and there they were. I believe we tried to cheer, but probably it was more like a yell, although for the moment I was up and staggering about quite strong-like. They carried us on board, and then came warm baths, soups, bandages, blankets, everything that kindness could do; and once again we had a whole night's rest, and on bedding too. They searched all next day for more survivors, but found none, and two days afterwards we were in Calcutta."

Thus far from the boy himself; but his story may be finished by a letter from a friend, who writes: "When the news came that the steamer was coming up the river we went to the rowing club, got a boat and some cushions and rowed down to meet it. We scarcely knew him; he looked ten years older; the colour of his eyes had quite changed; he could scarcely stand; so you may imagine what he must have been like when they found him two days ago. We got him very carefully on shore and home, and when we put him to bed the sight was fearful. His legs and arms were those of a skeleton; there did not seem to be a piece of whole skin on him, all hanging in flakes, and all the bones rubbed bare where he had been knocked about on the raft and the rats had afterwards attacked him. We wrapped him up in cotton

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wool, soaked in oil, and the doctor took charge of him; but this morning, although it will be some time before he gets rid of that lost and wan look in his eyes, he is already better—says the feeling of being among kind friends is so delicious, and that he hopes soon again to be fit for duty."

And that, Sir, is a good word to leave off upon. In a sailor's calling the highest of all praise is that he did his duty; and the bloom is soon rubbed off the proper doing of even difficult duty if too much praise is given to it—still the performance of duty is helped by sympathy and example, and if some other sailor-boy should read this story, its recollection may sustain him in like circumstances—if such a time of trial should come—may help to make his kith and kin proud of him and thankful for him, and, above all, prayerful for him, that when the duty has been done and the peril past he may forget all about it except so far as the recollection may help him to do his duty again when next the occasion arises.

I have the honour to be, Sir, your obedient servant,

THE BOY'S FATHER.

MERCANTILE MARINE EXAMINATIONS.

IN the February number of the *Magazine* we took occasion to make a few general remarks on the palpable defects of the system of examination adopted by the Board of Trade in respect to the various grades of officers of the Merchant Service. Our strictures have on the whole been favourably received; but our statement that the standard of efficiency has not been raised has been questioned in more quarters than one. Let us trace the course of the examinations from 1851 until now. The following is a list of the problems in practical navigation and nautical astronomy that inaugurated the system :—

1. Multiplication by logarithms. 2. Division by logarithms. 3. Day's work complete. 4. Latitude by meridian altitude of the

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sun. 5. Difference of longitude by parallel sailing. 6. Course and distance by Mercator's sailing, 7. Finding the time of high water at a given place. 8. Finding the variation of the compass from an observed amplitude of the sun. 9. Finding the longitude by chronometer and an altitude of the sun. 10. Finding the variation of the compass from an observed azimuth and altitude of the sun. 11. Latitude from a single altitude of the sun off the meridian. 12. Latitude by meridian altitude of a fixed star. 13. Correcting courses for the deviation of the compass.

Most of the problems of this list are essentially practical, and would have to be adopted whatever range the examination of seamen might take.

At starting (in 1851) multiplication and division by logarithms formed no part of the examination. Numeration and the first four rules of simple arithmetic occupied their place; these however were subsequently abandoned, and thenceforward until 1857 the problems consisted of those enumerated above, apportioned as follows:—For second mate, problems 1 to 5; for only mate, 1 to 8; for chief mate, 1 to 11; and for ordinary master, 1 to 13. In 1857 longitude by chronometer (9) became part of the only mate's work, and from that date until 1872 no further alteration was introduced. Meanwhile, however, all grades were examined as to the use of the sextant, and reading on and off the arc, while those higher than second mate were expected to understand the adjustments of that instrument, how to find its errors, and how to rectify them. The chart at that time, as now, formed no part of the second mate's examination; but the only and first mates, as well as the master, were expected to know the name and use of every line and mark on any chart placed before them, and were required to lay off the place of the ship both by bearings of known objects, and by latitude and longitude. As the examinations in sextant and chart were, at the date to which we refer, *viva voce*, the candidates had to be well instructed in those departments, for, in some of the principal ports, notably London and Liverpool, the tests of competency were exceedingly crucial, and it could never in those days be said, as it has been said since, that a candidate might leave the examination room with the order

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to get his certificate, at the same time not knowing the name or use of a single line on the chart.

We are fully aware that there were in those days irregularities in the mode of examination and that the systems in practice at the different ports were by no means uniform. But the intentions of the Board of Trade were good, as a circular, dated June, 1857, sufficiently shows, and in which the Board desires that the examinations should be as much as possible assimilated, and that every candidate, for whatever grade, should begin with No. 1 of the examination papers, and work out the whole of the papers up to that specially appropriated to the grade for which he desires to obtain a certificate, to show that he has kept up the knowledge he had previously acquired.

With the exception of a *voluntary* examination on compass deviation, consisting of 47 *printed* questions, introduced in 1870, no alteration in either the re-arrangement or form of the examination papers (already quoted) was made between the years 1857 and 1872. At the latter date, in problem 3 (the day's work) the courses were thenceforth to be corrected for deviation as well as for leeway and variation; problem 6 (course and distance by Mercator's sailing) came to be included in the second mate's work; into problems 8 and 10 (the amplitude and azimuth) the variation for the locality was introduced for the purpose of eliminating the deviation from the error of the compass; and in problem 9 (longitude by chronometer) the daily rate was omitted, and the candidate was required to find the rate from two given errors on different dates. All this indicated change in the routine, but can scarcely be called raising the standard of qualification. At the same date, problem 13 of the master's examination was suppressed, and its place was taken by 18 *printed* questions on the "deviation of the compass," of which twelve were to be marked by the examiner, and at least 8 were to be correctly answered. This paper included the construction by the candidate of a deviation curve upon a Napier's diagram.

It was also at this time that "all candidates presenting themselves for examination for master's and mate's certificates for the first time, were required to give *short definitions*" of at least ten out of

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45 *selected terms* in navigation and nautical astronomy. These inevitably fell to the second mate,—to the first mate and master only occasionally. But there was no difficulty with them, for the 45 terms were specified in a *printed circular*, and as the definition of each was to be short—with no diagram or figure to elucidate it—a few brief sentences sufficed to despatch this part of the examination. As a test of knowledge, this paper has been, and continues to be an utter failure; it could not be otherwise with the terms limited as to number and kind. But it might have been wholly different. Had the second mate been warned that he would have to give a fair definition of eight or ten terms of *general occurrence* in navigation and nautical astronomy, and illustrate the same by a simple figure or diagram, he must then have learnt the nature and value of at least three times forty-five terms; in fact he must have made the first step towards *learning* the subject on which he was to undergo an examination. At present the candidate is often called upon to explain certain given terms—of which he has but a hazy idea—through other terms of which he has not the most remote conception; and the explanations amount to "words—mere words." And in saying this much, we really deal leniently with the paper and the mode of its reception; we might in justice have been much more severe. The paper in its present limited form might be abolished, for any useful purpose it subserves.

In 1874 a decidedly retrograde step was taken; the examination on sextant and chart, which had, up to this date, been *vivâ voce* was thenceforth to take the form of *written answers* to a set of questions all of which were announced in a *printed* circular. Of the twelve questions allotted to the sextant all were required to be "answered in writing" by first mates and masters, and nine by second and only mates; in addition to which it was, however, expected that candidates should be able to read both on and off the arc, and point out the screws used for the various adjustments. In so far as the examination on the sextant is concerned the chief defect in the change lay in this direction — that, for the oral explanation of the adjustments, brief but sufficient for the purpose, was now substituted a mass of verbiage, as well as reiteration of the names of certain screws and parts of the instrument, to the

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extent of making several of the answers little better than tautological nonsense. But the abolition of the oral examination on the chart was attended with even worse consequences ; there were in all eleven questions for masters to answer, and six for first mates and only mates ; and the chief characteristic of these questions lay in the direction of wholly failing to detect the ignorance of a candidate on points most essential to safe navigation. Knowing the precise questions to which answers were required, the candidate learned by rote what it was known the examiners would take. Parallels and graduated parallels, meridians and graduated meridians, the course and distance between two given points A and B, &c., &c., were accurately enough described on paper, but many and many a candidate must have been "failed," had a chart been suddenly sprung upon him in order that he might point out what he had so ingeniously described in writing.

At this date an additional question (19) was introduced into the examination on the deviation of the compass.

The next step was the introduction in 1878 of "Sumner's method" by projection—an excellent problem if properly treated—but the significance and importance of which was not grasped in the Board of Trade papers. It has always taken the one form—the projection of lines of position arising out of computations based on two assumed latitudes ; there is no objection to this special form, but it might also have occasionally been utilised as a means for the introduction of Time-Azimuth Tables, and the Latitude by D. R. Unfortunately it has too often been formulated as a fancy article, such that a result within the examination limits could only be obtained by the use of a particular set of tables, all the while that candidates are "allowed to work out the various problems according to the method and the tables they have been accustomed to use."

The final change was made in 1881 ; it lay principally in the direction of a re-distribution of the problems in navigation and nautical astronomy (see pp. 508-9). The second mate has now to work the same problems that formerly appertained to only mate (viz., 1 to 9), and the only mate's requirements are those of the first mate (viz., 1 to 11). The additions are the alt-azimuth,

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verified as a time-azimuth, and a total alteration in the "examination in chart." The time-azimuth is a judicious introduction which has been too long delayed; and the eight questions on the chart are a decided improvement as compared with the eleven of 1874; so far as they go they are practical, but still defective in the sense that they encourage ignorance rather than promote knowledge.

How then stands the examination to-day as compared with what it was in 1851? The problems in navigation and nautical astronomy, constituting the routine of the first day, are the same now as they were then, with the exception of the introduction of deviation into the day's work, and a trivial terminal alteration in the amplitude, azimuth, and longitude by chronometer. But these changes are of a character too slight to be, in strictness, termed a raising of the standard of qualification, though the re-distribution of the problems may be so classed in respect to the second and only mate. "Sumner" by projection and the time-azimuth by inspection —too long delayed—are of course *additions* to the mate's and ordinary master's work, and admittedly improvements. But when we look beyond these we find, as a substitute for the earlier oral examinations in sextant and chart, a multiplicity of written answers to a *specified* set of terms and questions which, having been learnt by rote, render the examinations valueless as a test of knowledge. The *subjects* are properly selected, and are such as the merchant officer of to-day should be perfectly familiar with, but they are not studied,—they are crammed to-day, and forgotten to-morrow. This being recognised, the system is neither sound nor good for examiners or candidates. The work of the former in perusing the mass of writing must be perplexing and onerous in the extreme; the latter regard the system as one for collecting fees. As a gentleman tritely remarked in reference to the examinations, and to whom it had been represented that the candidates no longer studied navigation and nautical astronomy,—"Why should they study or pay to learn any of the subjects, if the Board of Trade examiners are content, and they get the certificate of competency they require." The aim of the system has been to arrive at uniformity in the examinations as conducted at the

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different ports; the result, instead of fostering the education of the younger officers, has rather tended towards a dead level of ignorance; but, as under the worst system of education there must still be a few great scholars, so, if we have a few good navigators, it is not through, but in spite of, the examination. For our own part we doubt whether the examination will ever be satisfactorily formulated until in letter and spirit it represents such an education as might be obtained through the medium of a Mercantile Marine College, the establishment of which we have before advocated, and to the necessity for which we shall continue to draw attention.

J. SCOTT RUSSELL, M.A., F.R.S.

IT is with much regret that we have to chronicle the death of this distinguished naval architect on the 8th June, at the ripe age of 74 years. He began life when steamship construction was in its infancy; he built the largest steamship ever launched; and he lived to see the time when steamships had appropriated the great bulk of the carrying trade of the world. The bent of his mind in the direction of mechanical science was displayed at an early age. While quite a young man he became manager of a shipbuilding yard at Greenock, and there commenced his investigations into the nature of wave motion. After a long series of experiments, he communicated the results of his researches to the British Association in 1835, which excited so much interest among the members, that it was resolved to prosecute further experiments of an exhaustive character, and it was in conducting these that Mr. Scott Russell discovered the so-called "Wave of Translation." In 1837, Mr. Russell read a paper before the Royal Society of Edinburgh, "On the Laws by which Water Opposes Resistance to the Motion of Floating Bodies," and received the gold medal of the Society, and was elected a member of the Council. In the "Transactions" of the Institution of Naval Architects for 1860

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and 1861, as well as in his "Manual of Naval Architecture," Mr. Scott Russell explains with much clearness the application of his wave-line theory to the construction of ships, and in numerous instances he practically applied his theory with very successful results. In 1845, Mr. Russell settled in London and for some years followed his profession as an engineer. In 1847 he was elected a Fellow of the Royal Society and admitted a member of the Institution of Civil Engineers. Ultimately he took to shipbuilding on the Thames, and in conjunction with Mr. J. K. Brunel who first conceived the idea, built the *Great Eastern* steamship. This is popularly regarded as the great work of his life, and he will doubtless be most widely remembered as the builder of the largest steamship ever launched. Mr. Russell was one of the founders of the Institute of Naval Architects, and contributed no less than twenty-one papers to the Transactions of that Society. One of these was on "International Communication by Railway Steamships;" and it may be added that his last work of naval construction was the steamer on the Lake of Constance, which carries railway trains between the termini of the German and Swiss railway systems on the opposite shores of the lake. Many improvements in shipbuilding are due to Mr. Russell, and his numerous able expositions of the principles of naval architecture have been of the greatest service in the development of modern shipbuilding.

CORRESPONDENCE.

CHANNEL NAVIGATION AND RULE OF THE ROAD AT SEA.

To the Editor of the "Nautical Magazine."

Sir,—There are many points in your article in the May number on "Channel Navigation" which deserve a close examination, more especially as the greater number of the accidents from collision can reasonably be classified under the head "Preventible." No doubt but these "lanes" for traffic tend to diminish collision, but the writer of the article is most probably right in looking to

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other means as well. What these means should be are only discoverable by close study of the conditions which make for and against collision. Most unfortunately for shipping, it is not usual to do more than roughly conclude from a possibly limited personal experience, or at best from a not very close examination of the facts of one or two well known cases of collision. There is, moreover, too ready a belief in the flexibility of the steering and sailing rules—an acceptance of them with a reservation which is entirely illegal. Into this latter error the writer of the article appears to fall when he says that "it behoves all masters of sailing vessels, on approaching a steamer, to act with double caution, and to endeavour if possible to keep clear of the towering iron stem." This advice is distinctly illegal, as the theory is that the sailing vessel shall continue absolutely *in statu quo* on the approach of a steamer, because it is alleged that the steamer will be misled if the sailing vessel makes any change whatever.

Then an examination of a sufficient number of collision cases does not bear out the writer's general conclusions about lights, and what is done on sighting them. If you take say one hundred collisions in order as they are tried in the courts, and set aside all where lights are not involved, you will see (1) a large proportion taking place after one or both ships had altered course to a doubtful light; (2) a still larger proportion where the helm used was port helm to a green light, or starboard helm to a red light; (3) there will be no collisions where these movements are not present.

If you choose to examine further into this remarkable fact you may discover that, except in rare and quite exceptional cases, these movements tend to multiply the risk to even as much as twenty times what the opposite ones would involve.

It is comparatively rare to find a case in which the blame is thrown upon bad lights, where the colour of the light has not been seen, and the most dangerous helm thereupon used.

It is no doubt open to say that if the distance had been greater the dangerous helm would not have mattered, but to any one who has really made a practical study of the question it is known that right helm will save the ship at very close quarters indeed,

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and an opponent may be fairly asked to show a collision which was not preceded by wrong helm.

Then in any case the broad fact remains that as the weather gets thicker, so collisions diminish.

Mast-head lights visible fifteen miles, as mentioned in your article, must be, I should say, horribly dangerous. No one will slow his engines or back his maintopsail to a light fifteen miles off, and how is he to know whether the light he sees is a bright one fifteen miles off, or a dim one 100 yards off?

But we shall never diminish collisions till we come back to the wisdom of our ancestors. We have in our present rules deliberately trangressed their most cherished *dicta*, and yet no one has yet said distinctly why.

Our ancestors taught and insisted in the strongest terms, that if it was your business to keep out of the way of a ship, you must never attempt to cross her bows. *We* say, you may always cross her bows *if you think at the moment* it is safe to do so.

Our ancestors said to the holding-on ships, it is true you have the right to continue your course, *but you must never insist upon your right*. If you have the slightest doubt, you must yourself "give way," and pass under the other ship's stern.

We say, this is exceedingly dangerous advice; our ancestors said, it was the safest advice possible.

If our ancestors had thought of red and green lights, they would certainly have said "never starboard to a red light; if it is your duty to give way to it, port at once and use no other helm." They would have said, "never port to a green light; if you have the right of way, do not insist on it, but use starboard helm and no other, if you have the least doubt."

Seamen do not generally know how very right our ancestors were and how very wrong we are. They do not know that if one ships ports to the red light, and the other starboards to the green one they may avoid collisions which can be avoided in no other way, and can never make collisions except at very close quarters indeed, and in very exceptional positions under very exceptional conditions.

It is only by a long course of corrupted custom that we have

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lost the power of seeing the truth; but I suppose the next very disastrous collision may give us a real examination of the facts of the case.

Yours obediently,

May 14th. P. H. C.

[The subject of "P. H. C.'s" communication is discussed on page 498.—Ed. *N. M.*]

LAYING-TO IN A GALE.

To the Editor of the "Nautical Magazine."

Dear Sir,—The letter of Captain Malet, published in your June number, is the only criticism I have seen on my letter which you did me the honour to publish in the March number; for Captain Lecky's article in May, and the letter from Captain Kiddle in the current number, appear to corroborate rather than criticise the statement that I made in the last paragraph, which statement I believe was the only opinion I ventured on the subject, the first part of that letter being entirely a recital of my actual experience. I will feel obliged if you will kindly allow me the space for a brief reply to Captain Malet's letter.

In the first paragraph after the introduction, while acknowledging that "There have been cases similar to the writer's, it must be admitted, when vessels have lain in the trough of the sea, with machinery or rudder damaged, for hours or even days without sustaining any material injury," he says, "but I fear that these have been the exception, and not the rule, as how many results have been far different," to which I reply by asking for known instances of screw steamships having met with serious injury after having stopped in a gale, always assuming that they were in good condition when the manœuvre was executed, and had not continued steaming head into a heavy gale and sea until they were more or less disabled.

In the next paragraph Captain Malet states that "A finely-modelled and not deeply laden steamer, when disabled, may live in a sea which would submerge an ordinary cargo vessel, though the latter may be built as strongly as steel or iron will permit."

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In reply I submit Captain Lecky's experience in the *British King*, which ship, although probably one of the best cargo steamers afloat, was as deeply laden in proportion to her dimensions as any steamer out of Liverpool in the North Atlantic trade; and also Captain Kiddle's experience in "a small steamer well down in the water," when "every possible device was tried to make her lie easy, but all failed." Coming now to Captain Malet's experience, in "October last, when in an iron steamship, hove to . . . . in a terrific sea, the vessel was struck when about four points off the wind, not having steerage or headway at the time (being, in point of fact, unmanageable) by a sea which stove the bow, &c." I respectfully submit, in reply to this, that the ship's engines must have been going a-head nearly full speed, or it would have been impossible for the steamer to have been within four points of the wind (and sea); and, as to her "not having steerage or headway," it would be also an utter impossibility for her to have been in that position without both. In the letter in the March number of the *Nautical Magazine* I submitted that "every experienced officer knows that it is impossible to steer a ship in such weather . . . . and constantly head the sea within two or three points," but certainly a steamer must have some steerage way to be within four points of wind and sea in a heavy gale, because her natural position under those circumstances, with engines stopped, is undoubtedly with the wind from two to four points abaft the beam. To the statement "I do not hesitate in saying that, had the ship been a-trough at the time, she would have been overwhelmed," I submit again Captain Kiddle's assertion that "a considerable amount of drift took place, *leaving a well-defined wake to windward*. It appeared to me that, immediately the great waves reached a certain point in this wake, they rolled over short of the ship, only sending a shower of spray on board;" and I think this fact may also be a sufficient reply to the remainder of the paragraph. As to "the danger by the heavy rolling, of having the boilers unseated or the cargo shifted," I can assure anyone who has not tried it, that the rolling of a screw steamship, when stopped in a gale, is not only less, but that it is also very much easier than when attempting to steam head to wind

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and sea. To the suggestion "that these considerations ought to be sufficient to induce an ordinary prudent man to endeavour at all times to keep his vessel's bow to the sea when it is unsafe to run," I reply, that after sixteen years' experience in the North Atlantic in screw steamers from 1,000 to 6,000 tons, and of from 100 to 600 nominal horse-power, I do not hesitate to say that there are not ten steamers in the business that could steam head to wind and sea against some of the gales encountered in the winter of 1881 and 1882 without falling off from two to four points; and when a ship has fallen off four points from the wind and sea, going from two to five knots through the water, with the rudder hard down and the engines turning at half or three-quarter speed, I contend it would be impossible to conceive a more dangerous situation.

In conclusion, I must state that, after a careful reading of Captain Malet's letter, I still hold firmly to the opinion expressed in the March letter, that when the sea becomes so heavy that serious damage is apprehended, or is even liable to be encountered, it is safer for any screw steamship to stop and lay-to with her quarter to the sea (not in the trough of it), than it is to continue attempting to steam head to wind and sea, thereby running the risk of serious, if not fatal damage.

Liverpool, June 10th, 1882. J. W. SHACKFORD.

P.S.—In my former letter, published in your March issue, one paragraph was omitted, which makes the following one read as though the ship was stopped the *second* time in consequence of "an accident to the machinery," when the idea I wished to convey was, that I stopped because in my judgment she would make much better weather than she was making steaming head into a heavy gale and cross sea.

J. W. S.

To the Editor of the "Nautical Magazine."

DEAR SIR,—I beg to offer you the following remarks on heaving a ship to in a gale of wind, drawn from the perusal of a letter in your March number:—

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Taking the latter portion of the letter, gale of November 26th, 500 miles west of the Fastnet—

1st. Position.—Wind S.W.; ship, I presume, heading about W.S.W. by statement. Here ship bows the sea, and wind is sufficiently on the bow to steady her—with canvas—although this latter is never mentioned in the letter referred to.

2nd. Position.—Wind still S.W.; ship's head put N. ready for a N.W. shift of wind.

This places ship in a dangerous position, I should think, even with canvas set, for the rolling must be something dreadful; while on the weather roll there is the danger of sweeping decks, or foundering—starting cargo, perhaps machinery.

3rd. Position.—This position, from an experienced seaman's point of view, seems simply ridiculous. Here is a ship with the wind now N.W. (shift has taken place); she is heading E.N.E. to E. by N. This would put wind from two to three points abaft port or weather-beam; whilst first or S.W. sea would take her about two points on lee or starboard-quarter; and the making sea from the N.W., which always causes great confusion, and is the most dangerous, will be two or three points abaft the port or weather-beam, which is a situation every seaman tries to avoid (I write of seamen in the acceptation of the term as applying to men who know their profession from long experience—men trusting to canvas with its accompanying risks of change, and force of wind, sea, &c., but having no other motive power at their command, and herein lies the difficulty and tact of handling, especially a heavy ship with the number of hands which make up the aggregate of crews in the present day). I repeat, every seaman would try to avoid, and with a motive power of steam at his command would avoid! so long as he could keep steerage way on his ship, assisted by canvas to steady her against the force of the sea. After the letter to which I have referred, there was another appeared in *Nautical Magazine*, June number, on same subject—how to heave a steamship to in a gale of wind—as sort of backer of the former; whilst another very sensible one, put in the same paper by the side of this latter, completely put this new theory in the shade. In the first letter,

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written by the party who put this theory in practice, no mention is made of sail, so I presume from this it was never used.

Now every experienced seaman knows how much faster a sailing ship hove-to in a gale of wind will drift than a steamer, from the lofty top hamper she has in excess of the steamer; still I never have heard during forty-five years' experience in all classes of vessel, of a sailing ship drifting fast enough to clear a side sea. Disasters will occur with every care that an experienced commander may exercise, but with steam power available and as long as machinery holds good and can be worked, I am of opinion there is not much to fear from wind or sea, and that every effort should be made to avoid the dangerous part of a cyclone, allowing he has sea-room to manœuvre.

I am afraid there is a great amount of recklessness in the go-ahead system in well appointed ships; many more disasters due to cheap work and inferior material, and last, but not least, bad handling from inexperience in the working of sail to advantage; to this cause I think may be attributed many of the missing ships.

Adhering to the subject I began with—"Heaving-to and avoiding as much as possible falling into the trough of the sea," I will quote an example, nothing fresh or novel, but what every commander of any length of service has had cause to do.

A ship is hove-to, of course on best or easiest tack. Wind veers until a beam wind would enable ship to run her course. Allowing sea has followed the wind and is also on the beam, but heavy—it matters not in our present case which way the wind veered. The master anxious to run, not to lose more time, bears away, claps on all the sail his ship and spars will bear with safety, finds the risk too great and is compelled to round to again, and even think himself fortunate if he completes the manœuvre without damage; for with all the sail he can carry, it is insufficient to keep his ship from rolling to windward in the trough of the sea; and the fear he entertains of the great danger of not only getting the decks swept, but stove, and perhaps foundering. I have had to do this on more than one occasion, especially in the high irregular broken sea encountered about the Cape of Good Hope going eastward. There is only one other

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great danger equal to this, viz., carrying a press of sail on a ship and to be taken suddenly aback; very frequently this occurs through their negligence, for if everything cannot be taken off in time, there is, in ninety-nine cases out of every hundred, sufficient warning given by the appearance of the weather to reduce sufficient sail for handling yards, but this requires vigilance—"a good look-out." These two cases I repeat have ever been considered the greatest dangers to be avoided.

With these views of heaving a ship to, I will quote another experienced in a steamship, 800 tons register, hove dead to in the middle of the Bay of Biscay. The captain, a thorough sailor, adopted the old plan, by putting as much reefed fore-and-aft sail on her as prudent, boom sheets bowsed well in, nearly amidships, to steady her from rolling,—"she was schooner rigged." The wind blew hard from the W.N.W. with as heavy sea as I ever saw, propeller going easy, and well watched in case any more power might be required; helm kept a trifle to leeward.

The little craft laid heading (nearly) this tremendous sea as steady as a bird; she rode out the gale without a murmur, and the only water she shipped was occasionally over the stern, when her bow would rise to an unusually heavy sea. I feel fully convinced had this new theory been adopted the poor little craft would have foundered.

I will record another case in my experience. I was running in a very hard gale from the W.N.W., severe squalls, and a very high sea running; by reckoning, I was on the meridian of Scilly, when the officer of the deck reported "steamer on starboard-bow," with signals flying, heading northwards; as soon as I could with a glass read the hoist I saw it was "I am in distress and want assistance." This I answered, when he hoisted, "I am sinking." By this time I was right a-head of her, I hoisted, "I will heave-to; send your boats," which he answered with, "Boats are all smashed." Several vessels ran past without noticing her. The rolling of that steamer was something distressing to witness as she lay in the trough of that heavy sea. She had no sail set. I shortened sail and brought my ship to the wind, under lower fore and maintopsails—her lee-side was buried; however I obtained a

volunteer crew for my lifeboat. Gripes were cut, falls passed all ready, when a dark squall shut the steamer out of sight. My volunteers seemed to hesitate, and asked my opinion, whether I thought they would succeed in fetching the steamer from the distance to leeward which we had drifted. I replied, "Without wishing to discourage you men—unless every man who goes in that boat can rely thoroughly on his being a good oarsman, with this wind and the sea now running, I doubt your ability to do so. But you must decide quickly for we are nearing the land; so for our own safety I cannot wait." They abandoned their project, and I bore away; about three-quarters of an hour after we made the Lizard point right a-head, about 4 p.m.

During my experience I never saw a heavier sea off that headland; however, I made the best of my way up Channel. On my arrival in London I heard that the lifeboat from the Lizard had rescued the crew, and the steamer foundered shortly after they left her.

Now, returning to where we started from on this subject, I would like to put the question in all earnestness to the, unknown to me, commander of that steamer: "What is your candid opinion on this new theory—stop a steamer, let her lie as wind and waves choose to drift her—? To lie to?" I will not answer for him, but I fancy I could with confidence. I feel sure he would try all in his power to avoid a repetition of that rolling boat. "Once," he would say, "in a life time is sufficient for any reasonable man."

In conclusion, I will just make one other remark. Everyone of any experience at sea will admit, I think, there is a great difference in a lee and a weather roll. The ship will gradually rise and roll to an advancing sea, though heavy; having arrived at the summit, she recovers herself, but falls over to windward very suddenly, as though she had lost all support of buoyancy, which means ruin. I would advise everyone to stick to the old rules, viz.: Put the ship on the tack that she bow the sea; keep as much canvas on her as prudent to do this, and also to avoid the heavy rolling she would otherwise acquire.

I might mention, the writer of the letter referred to adopted

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this new theory he advocates, from necessity through a break-down; and this occurred in the most severe gale of wind he had ever witnessed in thirty years' experience. He was agreeably surprised to find his ship lay with wind and sea from two to four points abaft the beam without shipping a barrel of heavy water. Spray of course flew over the ship. Thus encouraged he has adopted the same method in similar cases on other voyages since from choice and with same results.

Now machinery, steam, and numberless other patent appliances have undoubtedly revolutionised navigation in the working and propelling power of ships, and with the large tonnage of ships, combined with their available appliances, we may, with ordinary success, almost defy the combined elements. Still there is no denying the fact there is destruction, even to death, when they do get the mastery. In proof of this, if my memory serves me rightly, the *Great Eastern* was handled as a mere toy—a plaything under these circumstances—powerless in the trough of the sea. Great progress has been made by man, but the winds and waves are the same as ever, and it behoves the mariner to minimise their destructive powers by every means at his command. In this, experience must be his teacher. This new theory may be progression, which most of us advocate, but it is of little importance unless improvement follows.

B. O. T.

FAIR TRADE.

To the Editor of the "Nautical Magazine."

Sir,—In the March number of the *Nautical Magazine*, I find an article on the above subject. As the question is of great national importance and at the present time is receiving much public attention, I beg you will favour me with space for a few remarks in reply to the strictures advanced by your correspondent.

He states, "there can be no question that a considerable deal of ingenuity is being expended in this country in the attempt to bring about a revival of certain economical principles which are commonly supposed to be extinct so far as our commercial policy is concerned. Only a few years since we imagined these doctrines

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had for ever disappeared, but recent events show that they were merely in a state of quiescence."

It is true the doctrines alluded to have only been in a state of quiescence. Free trade has found its winter in the cold blast of foreign disapproval, and for commerce to find its summer again, will require the sun of protection. We can scarcely expect an enlightened commercial community to remain long blind to self interest. Men of this class are as a rule too much absorbed in their business pursuits to find time for either newspaper writing or stump oratory, and conscious of the helplessness of opposition bow to circumstances and divert what they can of the inevitable into productive channels.

As a law-abiding people, we endeavour to find in Imperial legislation the outcome of either wisdom or necessity, and in the present instance did what we could with the provision made for us under the new *régime*, being fortunate in having the aid of those singularly favouring circumstances, the discovery of gold in California and Australia and the expansion of steam power in mill, road and ocean.

Had protective principles obtained under the impetus thus given to commerce in general, England would have been more commercially prosperous than we now find her, yes, and more so than if free trade in its integrity had been in force during the last thirty years.

All may not see the ridiculousness insisted upon by your correspondent in the attempt to unite the whole British Empire into one grand confederation. To many clear-sighted men there appears nothing Utopian in the idea, and comparatively excluded as we find ourselves from all foreign markets, the accomplishment should be worth an effort.

With the mother country in possession of a redundant population and vast wealth, she is in a position by encouraging emigration and expending a part of this wealth in the expansion of trade in the colonies to materially benefit alike herself and her dependencies.

If these colonies under the prevalence of so-called free trade doctrines have lately received the cold shoulder from the mother country, the action spoken of by your correspondent is a natural

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result. Under different treatment the reverse of antagonism would probably be found. With interests more conflicting than those which would obtain in a confederation between Great Britain and her Colonies, the experiment has succeeded in the United States of America. It cannot be now asserted that any material difficulty would arise through failure in communication, the most remote are not under greater disadvantages than the North of Scotland and West of Ireland were previous to the days of railroad and telegraph. And with our maritime or nautical proclivities, both of colonial and home growth, the traffic within ourselves would soon bring our neighbours to their senses especially if all were excluded who refused to enter upon terms of reciprocity. By such a step the British Empire would add to its own maritime supremacy, whilst the foreigner, deprived of the trade we now grant him, would decline. The foreigner at present enjoys the privilege of trading to our vast possessions exempt from restrictions embarrassing to our own shipping, whilst in return we are either wholly shut out as in the coasting trade of the United States or heavily handicapped by hostile tariffs on ship and cargo. Could we be worse off under any *régime*, than under such circumstances? or can such a commercial system as at present exists promote the primary object of increasing the national prosperity your correspondent admits to be so essential. He also states "that amongst the causes which have induced our colonies to adopt protective tariffs, first and foremost must be placed the desire to encourage their own manufacturing industries, and to some extent this has no doubt been attained." Were we captiously inclined this acknowledgment would stand us in good stead, for that which has encouraged native industry in one country would probably have the same effect in another. It was not, however, to protect native industry that protective tariffs were levied in our thinly peopled colonies, but to defray the expenses of the colonial legislature and government.

These colonies will in the nature of things, become more populous, and if exempt from the necessity of either largely increasing their national debt in providing expensive armaments, which direct connection with the mother country would excuse,

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these taxes would rather decrease than increase; and as many years must elapse before their interest could lay in other direction than that of agriculturists, for which Britain would be their best customer, we have no right to assume that the integral connection with the mother country would be objected to. If separate interests are to be taken into consideration, the balance will be in favour of the colonies; and if it be the fact—and who conversant with the circumstances can doubt it?—that the Southern States, to free themselves from the protective tariffs of the North, demanded separation, and waged a disastrous war to obtain their release, is it unreasonable to suppose that our colonies, producers of raw material, for which, as before said, England is the best market, would resist the boon offered, when under more extensive cultivation this raw material demands a larger market than at present required? To Canada, with her grain admitted free while a tax was imposed on that of the United States, the advantage would be great.

It may with confidence be asserted that the so-called Manchester school of politics has done much to shake the allegiance of our colonies, and probably no step has been so damaging to free trade as this proof of extreme selfishness. The advocates of this doctrine appear to overlook the fact that the world is not constituted on the principles of a "happy family," but that it has pleased Infinite Wisdom to separate mankind into distinct nationalities, who to secure independent action instinctively demand measures of centralisation, or in other words, the organisation and protection of a variety of native industries acting and reacting upon each other for self-support. We have an example of the difficulty to overcome these national distinctions in the sister Kingdom of Ireland. It will require ages to mingle the Celt and the Saxon into one common stock, or induce them to view matters from the same standpoint.

Of all races the Saxon is undoubtedly the most successful colonist, and as a whole our colonists are offshoots of this race (exception of course must be taken to the French element in Canada, and the Dutch* in South Africa), with these, and the Celtic element running through the whole, we shall find difficulty, but

* The Dutch are more distinct nationally than in race.

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the statesman's genius is best directed in overcoming difficulties, and with the redundancy of population and wealth at the disposal of the British statesman, it should not be a difficult task to cement the union of England and her colonies in mutual interest and support. To expect reciprocity from other nations, is to ask a reversion of the laws of Nature and the principles governing society.

Free trade in its integrity would be neither more or less than a system of barter, each country exchanging with the other that which are its natural products, or can be produced with the greatest facility. This would doubtless simplify trade, but would not advance the intellectual development of nations, and as we cannot either change our national instincts, of which patriotism is a branch, or go back to the beginning of things, we must pursue the course under which we can only arrive at commercial prosperity, and which, whether it be under a British confederation or acting separately, can only be accomplished by protecting native industries.

Before leaving this question of confederation, it will be necessary to touch upon another point of your correspondent's theory, namely, "that, in the event of the confederation being completed, it would only widen the area of a mutual taxing society." My mental vision may be at fault, but I fail to see any other process for holding society together than this mutual taxing principle. All governments, both Imperial and Municipal, must cease without it; benefit societies, trades unions, and all associations of the kind have this alone for their support, so also with taxes in support of the poor; yea also in the penny I pay extra to my butterman for delivering his wares at my door. I have the equivalent in the economy of time and shoe leather, and that penny enables him to maintain a boy, horse and cart; and look at the ramifications of handicraft this cart must employ before produced, the ore to make the iron to build the ship which brings the wood, &c., &c.; then there is the stable and food for horse, and wages for the boy aiding to support his family. It is these things wholly lost sight of by the free trader that form the cement of kingdoms.

We have an illustration more pointed than polite in the excuse your correspondent allows the fair trader for taxing bread stuffs.

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He states, "we will take it for granted moreover that our countrymen for Imperial considerations would be willing to tax themselves by paying an increased price for bread. On this point the fair trader like the servant girl who pleaded as an excuse for her indiscretion that her child was but a little one, urges that the increase would be only trifling, since wheat can be grown more advantageously in Canada than in the United States." Now as this tax upon corn more immediately affects ourselves than the colonies it may not be unreasonable, after the statements already made upon the mutual benefits to be derived from confederation, to treat the matter singly or as affecting home industries alone. Then to leave the servant girl out of the question, it may be admitted and moreover emphatically advanced that the fair trader's best argument is the minuteness of the burden the individual would be subject to, say on a five shilling per quarter duty on all imported corn. Taking the nation, for the sake of round numbers, say at thirty millions, which we know to be under the mark, the tax upon each person would be a fraction under a penny per week. Now if this be the fact, is our lust of greed so strong that this small sacrifice cannot be made for the benefit of our own people? I know the cheap loaf is and has been a powerful cry in the mouth of the free trader, but is he not in this cry penny wise and pound foolish, handicapped with Income Tax, Road and School Board rates, Factory Acts and other things from which his competitors are free, what other result than ruin can be anticipated from our farmers and in some cases manufacturers being forced into competition in such cases if we do not aid him. When ruin ensues as ensue it must, will it not cost more to maintain these people in idleness than the penny per week we have named? There is also another fact it will be dangerous to ignore. What of the discontent this enforced idleness will cause?

Again, if only the best lands will pay the farmer for cultivation the day cannot be far distant when property of this description will be reduced in value, and if all property bears its proportionate amount of taxes, upon what portion of the national income is the deficiency to be levied!

It is argued by your correspondent "that no fair trader has

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yet explained how a rise in price can result in a nett gain to the community, and we venture to assert he never will."

All articles of trade have a relative value in proportion to the purchasing power of the community; in countries where money is scarce, and communication difficult, articles of home production are low in price, and importations of goods are, as a rule, on a very limited scale; but let money become more abundant, similar to the influx into England and the United States through discoveries of gold* in California and Australia, and be infused into every branch of business, giving full employment to all industries and creating new ones, with railroads and every facility of communication, with hands in full work, wages rise, and demand increases in proportion to the spending power of the community; supply failing to meet demand, prices go up and profits in proportion; and as the game is all round, each in turn—artizan, labourer and trader—will benefit.

Had this wealth of gold reached a home trading community, its true value would have been lost to the world, few would have been enriched and with low prices the community would have remained poor. Or on the other hand if goods had been imported, the merchant and foreigner would have been benefited, but not so the British artizan or manufacturer; and herein rests the difference to the working-classes of Britain between free trade and protection or encouragement to native industry.

If this be the "beggar my neighbour" policy spoken of, I hope the desire to maintain it is more general than your correspondent supposes, so that we may enrich ourselves.

Those opposed to the principle may not expect the free trader to claim any magic power for the system, but they do expect him to show some countervailing agency to operate against the direct influence of hostile tariffs.

In the absence of any such agency, is it blameable (we may so infer from your correspondent's remarks) on the part of the fair trader to show how this may be done on the most legitimate of all bases, the natural resources of the British Empire. Nor can the

* A legal issue of paper with confidence behind would realise the same effect as gold.

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fair trader see any risk to our commercial supremacy, while true to ourselves, if other markets of the world were closed against us. There however need be no fear on this head. Individuals may be guilty of moral or physical suicide, but nations as a rule are sufficiently alive to their pecuniary interest to prevent commercial suicide. Yet this alone could bring about the isolation of Britain your correspondent appears to fear from a determination on our part to exact terms of reciprocity. Now let us examine this point, not forgetting the fact that it is man and not mechanism we have to deal with. It will not be denied that the protective tariff levied upon our goods by foreign nations are enacted by their legislature in accordance with the wishes of their people. Now taking man as we find him, he is more vain than malicious, and it may be supposed would be more flattered than annoyed by our following his example, and under the pleasing unction welcome us to a contest on equal terms. If he did not, anything worse than the present terms could hardly be awarded us. It is not to be expected that they will impose heavier duties upon themselves than at present appear on their tariff. If so there must be merit in the system it would be well to look further into. We shall, however, leave the foreigner to his own inventions, and if the worst comes to the worst see what we have to fall back upon. It is broadly stated, and probably not far from the truth, that the British Empire comprises about one-eighth part of the habitable globe situated in various positions and possessing every shade of climate, and combinedly capable of producing every article necessary for man's sustenance or enjoyment commercially or physically. That in many parts it is sparsely populated, in others, India and the Home Country, overstocked with people. That we possess in our Merchant Navy a fleet superior in speed to any other nation, and in tonnage equal to that of all other nations combined, and that we have resources for producing and maintaining a Royal Navy equal to any emergency. Now let us suppose a mercantile firm of ordinary ability in possession of a combination of circumstances so advantageous, would anything short of complete success be otherwise than certain? Should statesmen then be excused who for an idea would dislocate rather than unite

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this Empire into one grand union of mutual interest. If, as stated, Canada will tax herself to protect native industries which, while thinly populated, can only be a drag upon her resources, is it too much to ask that all she requires shall be supplied her at less cost than she can produce them, while all that she can produce with facility shall be admitted free into the world's best market. There will be many dissenting voices from your correspondent's view that the concentration of the United States gives them an advantage over Britain in trade with Canada. There is, we may admit, proximity at some points which may be advantageous, but if it be the fact that the Glasgow merchant can deliver a ton of goods at Quebec at less cost than he can transport the same by rail from Glasgow to London, the same will hold good in the expense of transport from the manufacturing districts of the United States to Canada. There is no conveyance so cheap as that performed by the ocean steamer. The heavy duties levied upon our goods in the United States to prevent our underselling their manufactures in their own markets does not argue in favour of underselling us in Canada.

Broad statements are not the soundest arguments, and to state "that England gained her commercial supremacy by supplying the world at large with manufactured goods," and to stop short after adding, "the fair trader suggests that she should turn her attention from foreign markets and devote it exclusively to the development of her own colonial resources," is to leave much unsaid.

Why does the fair trader suggest this? Because circumstances have changed our commercial relations with the so-called world at large. The convulsions and devastations in Europe from the wars at the commencement of the present century and the time required after these wars had ceased to restore order and resuscitate ruined industries was England's opportunity during this time, because they not only failed to supply their own immediate wants, but beyond receiving what they required from us, left to us the undisputed supply of the whole Asiatic and American markets. This is not the case at the present time. Most of these nations, on the whole commercial platform, are

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nearly self-supporting, and many, especially the United States, are keen competitors with us in foreign markets, which enables them from the high prices obtained at home, kept up by the tax levied upon our goods in their markets, to export their surplus stock at prices ruinous to us. These people do not overlook the fact that a shilling passing through twenty hands per day, giving a halfpenny profit to each, nearly doubles its value in that short time to the community; whereas, to send it abroad, would, at the utmost, be only a halfpenny to the merchant's profit in a much longer time. To illustrate this in another form, if a five shilling duty on corn will enable the British farmer to till his land with profit, and this profit enables him to bring more land into cultivation, and spend more largely on the common necessaries of his craft and family—and let us not deny him the boon—indulge in a few of the luxuries of life, each article in the entire catalogue yielding profit to the seller, and employment to the labourer and artizan, is not this five shilling duty likely to be returned doubled to the community; and, if so, why call this protection to a separate industry instead of national benefaction.

It is on this principle our neighbours are acting—bolstering up, if it pleases your correspondent to so call it, native industries with the best stuffed cushions of political economy, whereas, from short-sighted parsimony, we leave ours out in the cold to decay. We ask nothing but fair play to compete successfully with all comers, but do not risk your champion to fight with single stick an adversary armed with sword and shield.

I am, Sir, your obedient servant,

London, March 17th, 1882. PROTECTIONIST.

[We wish it to be understood that we are not shaken in our belief as to the wisdom of the free trade policy, and that we give insertion to the letter of our worthy correspondent because it is an able defence of the views of the fair traders.—Ed. *N. M.*]

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BOOKS RECEIVED.

Our Great Peril if War overtake us with our Fleet deficient in Number, Structure, and Armament. By Admiral of the Fleet Thomas M. C. Symonds, G.C.B. London: W. Kent and Co., 23, Paternoster Row. 1882.

The gallant Admiral's *brochure* is characterised by a patriotic spirit and a commanding knowledge of the details of his profession. We do not share his alarm as to our condition of peril, although we are of opinion that our defensive and offensive powers require vigilant looking after and that it is false economy to cut down expenses until efficiency is sacrificed.

The struggle for naval supremacy must inevitably be always going on, and consequently there will always be honest-hearted and enthusiastic alarmists like the distinguished author of this work, who dread the loss of our maritime power, and who certainly do good by not allowing the matter to become dormant.

British Merchant Shipping, Considered as an Investment. By William Baker, M.A., L.L.B., of the Inner Temple, Barrister-at-Law. London: Spottiswoode and Co., 54, Gracechurch street. 1882.

The object of this pamphlet appears to be to draw attention to British steam shipping as an outlet for capital by which large dividends may be realised, but which is practically inaccessible to the general public, owing to certain failings occasioned by the present method of its management and to the ignorance extant concerning the importance of this class of property as an investment.

The condition of things as described by Mr. Baker cannot be regarded as overdrawn. There is no doubt that a more open market for the transfer of shipping property might with advantage be established; that a more accurate system of registering owners might be brought into operation; that some improvements as regards the general management of ships and

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responsibility for their efficiency and safety might be introduced; all this is well known in the shipping world, and we ourselves have more than once drawn attention to the subject. But we do not find that Mr. Baker propounds any definite scheme for the remedy of the state of things which he denounces; he simply calls attention to the subject apparently in a philanthropic spirit, and hopes to awaken "interest hitherto dormant." We cannot conceive this to be the sole mission of Mr. Baker's well-written little pamphlet, although he states that it is not for him to hazard an opinion as to who should take the initiative in reforming the existing defects. The *couleur de rose* in which steam shipping investments are painted, conveys to our senses a faint suggestion of a prospectus intended for the perusal of the British public, and we have little doubt that the arguments so forcibly stated by Mr. Baker will be followed by some more definite action to supply the desiderata referred to in his pamphlet.

The Action of Lightning and the Means of Defending Life and Property from its Effects. By Arthur Parnell, Major R.E. London: Crosby, Lockwood and Co. 1882.

LIGHTNING, as a terrible and most potent agent of destruction, is more or less feared by us all, but the fear is largely increased by ignorance as to the causes of its manifestations and by our sense of powerlessness when its discharges take place. Any work, such as this under notice, which tends to dispel ignorance on this subject should receive a warm welcome from the community.

Major Parnell's method of dealing with the subject is novel, simple, and effective. He begins with a systematic statement of recorded facts and opinions, giving the authority in each case; he then erects what he calls a superstructure of theory on the preceding foundation of fact, and finally proceeds to state what appears to him to be the practical outcome of his investigations, and describes the various defensive measures which in his opinion should be taken.

The epitome of facts and opinions is most instructive, and for reference purposes of much value. In the superstructure of theory we find many of the current views regarding lightning put

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before us under slightly modified forms, but we also find other ideas more or less novel which are somewhat subversive of popular notions. Prominent among these is the opinion that the earth is frequently the originator of the electricity which produces lightning, that rain clouds are the condensers, and that very often the path of the lightning is from the earth to the clouds. In support of this view Major Parnell says that lightning is "too vivid and instantaneous to permit of the eye doing more than merely noticing its existence. . . . It seems quite impossible from sight to say positively whether lightning ascends or descends, a luminous rift or crack suddenly appears and disappears in the gloomy atmosphere."

He also instances numerous cases in which the indications are strongly in favour of the action of the explosion having been upward.

The sea we are told is a vast collector of electricity, of which under certain conditions a ship may become the medium of discharge. Major Parnell inclines to the belief that iron ships are less dangerous than wooden ones, because in the former a leakage of electricity takes place which does not occur in the latter. He is of opinion that Sir Wm. Snow Harris's system is very effective for discharging with safety an accumulation of electricity. As regards the practical measures to be adopted for defensive purposes, very full and useful information is given, to which the space at our command is insufficient to do justice.

We desire however to express our opinion that the work may be profitably read by all who wish to make themselves acquainted with the action of lightning. There is an absence of any sort of explanation of the phenomenon of thunder, but we cannot complain of this considering the scope of the work as indicated on the title page and in the preface, and also to the fact that life and property are not directly imperilled by thunder.

A Manual of Naval Architecture. By W. H. White. Second Edition. Revised and enlarged. London: John Murray, Albemarle Street. 1882.

THE appearance at no long interval of a second edition of Mr. White's manual was a foregone conclusion when the first edition

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was published. In our volume for 1878 we reviewed the work at length, but in calling attention to the issue of a new edition it should be stated that the various types of merchant ships are more fully dealt with and those parts relating to the design and construction of ships are amplified or re-written, thus greatly adding to the value of the book as a work of reference. Information as regards all classes of vessels is brought up to the latest date, and additions and extensions are made wherever they appeared to be desirable.

We heartily congratulate Mr. White on the well-deserved success of the first edition and on the early demand which has arisen for a re-issue of his standard work.

The Sunbeam Series. London : Longmans & Co.

CHEAP literature is the order of the day, and Messrs. Longmans and Co. have been foremost in the field with good works at cheap rates. The series sells at sixpence a number and, at present, consists of Lady Brassey's *Voyage in the "Sunbeam,"* Wood's *Strange Dwellings*, Whyte-Melville's *Kate Coventry*, Hartwig's *Arctic Regions*, and Trench's *Realities of Irish Life*. All are well illustrated, and are useful and readable works; which would pleasantly while away many a tedious hour at sea.

OUR LIBRARY TABLE.

WE have on our table the following works and pamphlets :—*Report of the Ninth Annual Conference* (1881) *of the Association for the Reform and Codification of the Law of Nations; Report on the Exhibition of Ship Models, &c.*, held in London in May, 1882, reproduced from the columns of the "Dagblad van Luid-Holland en s'Gravenhage ; *Revue Maritime et Coloniale*, Paris, May ; *Van Nostrand's Engineering Magazine* (New York), May ; *The Mercantile Marine Service Reporter*, for May, which contains the Report of the Proceedings of the 25th Annual Meeting of the Association ; *British Merchant Service Journal* (June) ; *The Shipwrecked Mariner*, No. CXIV., a periodical which always has good reading in its numbers ; *Annalen der Hydrographie und Maritimen Meteorologie*, Heft. V. ; *Annales Hydrographiques; Carnet de*

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l'Officier de Marine, 4° Année (Paris, Berger Levrault et Cie); *Rivista Marittima* (*Italian*); and *Revista Maritima Brazileira* (Rio de Janeiro) for June.

We must also call the attention of our readers to a new work by Capt. S. T. S. Lecky, "*The Danger Angle and Off-shore Distance Tables*," which must have taken considerable time in the computation, and is especially designed to determine the distance of a ship from the land. We purpose looking through the tables with care in order to ascertain their positive value and shall report on the subject in our next issue.

MARINE INVENTIONS.

Monthly List of Patents—Compiled for this Journal by Messrs. W. P. Thompson and Boult, British and International Patent and Trademark Agents and Consulting Engineers, 323, *High Holborn, London, W.C.; and Berridge Street, Leicester; also by Messrs. W. P. Thompson & Co.*, 6, *Lord Street, Liverpool.*

ENGLISH (APPLICATIONS).

2564. Edward Moxon, of St. Helena, Tunbridge Wells, Kent. "Improvements in the construction of barges and other similar vessels."

2684. Alfred Nickels, of Liverpool. "Improvements in ships' steerage berths."

2747. William Hamilton Hall, of Kew, Surrey. "Improvements in the rigging of sailing vessels."

2822. John Littlejohn, of Wallsend-on-Tyne, Northumberland. "An improved pontoon deck-house for steamships and other vessels."

CANADIAN.

14170. Heber Squier, of Grand Haven, Mich., U.S. "An improvement in ship fastenings."

14262. Frank Barr, U.S. "Improvements on signal buoys."

FRENCH.

145675. Arnaz, of Paris. "An insubmersive maritime apparatus for preventing shipwrecks."

145705. Bazin. "A hydraulic rudder."

145732. Mallory. "A torpedo."

145775. Porter. "Fitting berths."

145828. Farquahar. "Means of steadying floating bodies."

GERMAN.

18496. R. H. Earle, of St. John's (Newfoundland). "An apparatus for detaching boats."

PATENTS PUBLISHED.

4451. Peter Brotherhood, of 25, Ladbroke Gardens, Notting Hill, in the County of Middlesex. "Improvements in apparatus for discharging torpedoes under water." The object of this invention is to facilitate and render more rapid the operations for the above purpose. Within the vessel and on an axis parallel to the line of discharge, a cylindrical casing is fixed. Within this casing are provided two parallel tubes fixed to end discs which can be made to revolve by suitable gearing. In one position of the two tubes, one of them faces an opening to the interior of the vessel by which opening a torpedo can be slid in so as to occupy the interior of the tube. The other tube is then facing an opening to the exterior of the vessel through which the torpedo can be discharged by a telescopic pusher or other suitable means, thus whilst a torpedo is being discharged from one tube the other tube may be charged. For guiding the torpedo as it issues from the tube, a bar is hinged to the exterior of the vessel, which, when not in use, can be folded back into an external recess but which for use turns by internal gearing, in the direction of discharge. The inner end of the casing at the part which faces the tube in its discharging position, communicates by a pipe with the outside water so that as the torpedo is pushed along the water can enter behind it. Another part of the end of the casing communicates with the bilge so that the tube when discharged may be emptied.

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4453. October 12, 1881. 6d. John Milton Bibbins, a communication from John Du Bois, of Du Bois, Clearfield County and State of Pennsylvania, U.S.A. This invention relates to that class of dams and gates for docks, etc., which are made in sections raised and lowered by hydraulic power. The structure is commenced on rafted floating timber and supported by angle irons or mud sills and consists of a framework carrying the jointed leaves or gates, the axes of the joints lying across the flow of the water. One or more side shoots or flumes are provided for admitting the water underneath the leaves or for letting it off. The leaves consist preferably of three sections which lie flat or nearly flat upon the bottom when down. At least one of the sections is hinged to the framework, the second section being hinged to the first and so on. The first section and the third or apron are jointed to the upstream section, and overlap the second section. Into the edges of the sections are inserted strips or bars pressed outward either by springs or by water admitted behind them and these strips keep the joints tight. Wickets which may be worked by hand or machinery (preferably the former) regulate the admission of water to the flumes. Means are provided for automatically regulating the height to which the water can rise in the flumes, say for instance by making the height of one side of the flume capable of being varied by the addition to or withdrawal from the said wall of moveable boards. The use of wood is preferable, though metal may be used.

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TABLE OF THE

To be DEMANDED and RECEIVED by PILOTS licensed by the Cor- under the authority of the Acts of Parliament, 6 Geo. IV., cap. 125, Piloting Ships and Vessels within the Limits in the said Table

FROM	TO	7 Ft. & under.	8 Ft.	9 Ft.	10 Ft.	11 Ft.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
The Isle of Wight and vicè versâ	The Downs	3 4 0	3 12 0	4 0 0	4 8 0	4 16 0
Off Dungeness to off Folkestone, the Church bearing N.N.W. by compass, and vicè versâ	Ditto	0 18 0	1 0 0	1 2 0	1 4 0	1 6 0
Off Folkestone to the South Foreland—the Lights in one and vicè versâ	Ditto	0 10 0	0 12 0	0 14 0	0 16 0	0 18 0
The Downs and vicè versâ	Margate Roads or Tongue Light-Vessel	1 9 0	1 13 0	1 17 0	2 1 0	2 5 0
Margate Roads or Tongue Light-Vessel & vicè versâ	Gravesend	3 11 0	4 0 0	4 10 0	4 19 0	5 8 0
The Sea, the Downs, Orfordness, or Hoseley Bay and vicè versâ	The Nore or Warps	2 18 0	3 6 0	3 14 0	4 2 0	4 10 0
	Sheerness, Stangate Creek, or Blackstakes	3 6 0	3 16 0	4 6 0	4 16 0	5 6 0
	Thames Haven	3 4 0	3 14 0	4 5 0	4 16 0	5 6 0
	Gravesend or Chatham	3 14 0	4 6 0	4 18 0	5 10 0	6 2 0
The Nore, or Warps, and vicè versâ	Sheerness, Stangate Creek, or Blackstakes	0 16 0	0 18 0	1 0 0	1 2 0	1 4 0
	Chatham or Rochester	1 18 0	2 3 0	2 7 0	2 12 0	2 16 0
	Gravesend	1 12 0	1 16 0	2 0 0	2 4 0	2 8 0
Sheerness, Stangate Creek, or Blackstakes and vicè versâ	Chatham or Rochester	1 12 0	1 14 0	1 16 0	1 18 0	2 4 0
	Gravesend	2 6 0	2 10 0	2 14 0	2 18 0	3 2 0
Rochester or Chatham and vicè versâ	Gravesend	2 12 0	2 16 0	3 0 0	4 0 3	3 8 0
Thames Haven (Inwards only)	Ditto	0 16 0	0 18 0	1 0 0	1 2 0	1 4 0
Gravesend Reach and vicè versâ	Northfleet	0 4 0	0 6 0	0 8 0	0 10 0	0 12 0
	Greenhithe or Long Reach	0 8 0	0 12 0	0 16 0	0 0 1	0 4 0
	Erith	0 14 0	0 18 0	1 2 0	1 6 0	1 10 0
	Barking and below Victoria and Albert Dock	0 16 0	1 2 0	1 8 0	1 14 0	2 0 0
	Victoria and Albert Dock to Greenwich Pier	0 18 0	1 4 0	1 10 0	1 16 0	2 2 0
	Moorings, London Docks, City Canal, or St. Katharine's Docks	1 2 0	1 8 0	1 14 0	2 0 0	2 6 0
Greenhithe, or Long Reach, and vicè versâ	Barking and below Victoria and Albert Dock	0 12 0	0 16 0	1 0 0	1 4 0	1 8 0
	Victoria and Albert Dock to Greenwich Pier	0 14 0	0 18 0	1 2 0	1 6 0	1 10 0
	Moorings, London Docks, City Canal or St. Katharine's Docks	1 0 0	1 4 0	1 8 0	1 12 0	1 16 0
Erith Reach and vicè versâ	Victoria and Albert Dock to Greenwich Pier	0 12 0	0 16 0	1 0 0	1 4 0	1 8 0
	Moorings, London Docks, City Canal, or St. Katherine's Docks	0 18 0	1 2 0	1 6 0	1 10 0	1 14 0
Woolwich or Blackwall, and vicè versâ	Moorings, London Docks, City Canal, or St. Katharine's Docks	0 16 0	0 18 0	1 0 0	1 2 0	1 4 0
Pilots duly licensed to conduct Vessels beyond Gravesend, either inwards or outwards, and continuing in charge to or from any of the within-mentioned places, as the case may be, are to be paid. — The Sea, the Downs, Orfordness, or Hoseley Bay, and vicè versâ.	Long Reach, or Greenhithe	3 19 0	4 11 0	5 4 0	5 17 0	6 9 0
	Erith	4 3 0	4 16 0	5 8 0	6 1 0	6 14 0
	Woolwich or Blackwall	4 5 0	4 19 0	5 12 0	6 5 0	6 18 0
	Moorings, London Docks, City Canal, or St. Katharine's Docks	4 10 0	5 4 0	5 17 0	6 11 0	7 4 0
The Nore, or Warps, and vicè versâ.	Greenhithe, Long Reach, or Chatham	1 18 0	2 3 0	2 7 0	2 12 0	2 16 0
	Erith	2 1 0	2 6 0	2 12 0	2 17 0	3 3 0
	Woolwich or Blackwall	2 5 0	2 11 0	2 16 0	3 2 0	3 7 0
	Moorings, London Docks, City Canal, or St. Katharine's Docks	2 13 0	2 19 0	3 5 0	3 12 0	3 18 0

For taking a Vessel into or out of Ramsgate, Margate, Dover, or Sandwich Harbours, 5/0 per
For Vessels exceeding 23 feet, an increase in the Rates for each foot or part of a foot, in
The several Rates and Prices specified above are subject to a reduction of one-fourth part, in such Vessel shall be propelled by steam, or towed by a Steam-Vessel for a part only of the made on such part only of the said Rate or Price as shall be proportionate to the distance so
Inward-bound Vessels discharging a Pilot at Thames Haven, to pay him 10s. for Travelling

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poration of the Trinity House of Deptford Strond, or acting as such 16 and 17 Victoriæ, cap. 129, and 17 and 18 Victoriæ, cap. 104, for mentioned.

12 Feet.	13 Feet.	14 Feet.	15 Feet.	16 Feet.	17 Feet.	18 Feet.	19 Feet.	20 Feet.	21 Feet.	22 Feet.	23 Feet.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
5 4 0	5 12 0	6 0 0	6 10 0	7 0 0	7 10 0	8 10 0	9 10 0	10 14 0	11 18 0	13 2 0	14 6 0
1 8 0	1 10 0	1 12 0	1 16 0	2 0 0	2 4 0	2 8 0	2 12 0	3 0 0	3 8 0	3 16 0	4 4 0
1 0 0	1 2 0	1 4 0	1 8 0	1 12 0	1 16 0	2 0 0	2 4 0	2 10 0	2 16 0	3 2 0	3 8 0
2 9 0	2 13 0	2 17 0	3 2 0	3 7 0	3 12 0	4 1 0	4 10 0	5 0 0	5 10 0	6 0 0	6 10 0
5 13 0	6 7 0	6 16 0	7 11 0	8 6 0	9 0 0	10 0 0	11 0 0	12 6 0	13 11 0	14 16 0	16 2 0
4 13 0	5 6 0	5 14 0	6 4 0	6 14 0	7 4 0	8 2 0	9 0 0	10 0 0	11 0 0	12 0 0	13 0 0
5 16 0	6 6 0	6 16 0	7 8 0	8 0 0	8 12 0	9 12 0	10 12 0	11 18 0	13 4 0	14 10 0	15 16 0
5 17 0	6 8 0	6 18 0	7 10 0	8 1 0	8 12 0	9 10 0	10 7 0	11 13 0	13 0 0	14 5 0	15 11 0
6 14 0	7 6 0	7 18 0	8 12 0	9 6 0	10 0 0	11 0 0	12 0 0	13 10 0	15 0 0	16 10 0	18 0 0
1 6 0	1 8 0	1 10 0	1 14 0	1 18 0	2 2 0	2 6 0	2 10 0	2 14 0	2 18 0	3 2 0	3 6 0
3 1 0	3 5 0	3 11 0	3 16 0	3 19 0	4 5 0	4 14 0	5 2 0	5 15 0	6 8 0	6 15 0	7 17 0
3 12 0	2 16 0	3 0 0	3 8 0	3 16 0	4 4 0	4 12 0	5 0 0	5 12 0	6 4 0	6 16 0	7 8 0
2 10 0	2 16 0	3 2 0	3 8 0	3 14 0	4 0 0	4 6 0	4 12 0	4 18 0	5 4 0	5 10 0	5 16 0
3 6 0	3 10 0	3 14 0	4 2 0	4 10 0	4 18 0	5 8 0	5 18 0	6 10 0	7 2 0	7 14 0	8 6 0
3 12 0	3 16 0	4 0 0	4 8 0	4 16 0	5 4 0	5 16 0	6 8 0	7 2 0	7 16 0	8 8 0	9 2 0
1 6 0	1 8 0	1 10 0	1 14 0	1 18 0	2 2 0	2 6 0	2 10 0	2 16 0	3 2 0	3 8 0	3 14 0
0 14 0	0 16 0	0 18 0	1 0 0	1 2 0	1 4 0	1 6 0	1 8 0	1 10 0	1 14 0	1 18 0	2 2 0
1 8 0	1 12 0	1 16 0	2 0 0	2 4 0	2 8 0	2 12 0	2 16 0	3 0 0	3 8 0	3 16 0	4 4 0
1 14 0	1 18 0	2 2 0	2 8 0	2 14 0	3 0 0	3 8 0	3 16 0	4 8 0	5 0 0	5 12 0	6 2 0
2 6 0	2 12 0	2 18 0	3 4 0	3 10 0	3 16 0	4 4 0	4 12 0	5 6 0	6 0 0	6 14 0	7 8 0
2 8 0	2 14 0	3 0 0	3 6 0	3 12 0	3 18 0	4 6 0	4 14 0	5 10 0	6 6 0	7 2 0	7 18 0
2 12 0	2 18 0	3 4 0	3 12 0	4 0 0	4 8 0	4 18 0	5 8 0	6 8 0	7 8 0	8 8 0	9 8 0
1 12 0	1 16 0	2 0 0	2 6 0	2 12 0	2 18 0	3 6 0	3 14 0	4 8 0	5 2 0	5 16 0	6 10 0
1 14 0	1 18 0	2 2 0	2 10 0	2 18 0	3 6 0	3 14 0	4 2 0	4 16 0	5 10 0	6 4 0	6 18 0
2 4 0	2 10 0	2 16 0	3 4 0	3 12 0	4 0 0	4 8 0	4 16 0	5 10 0	6 4 0	6 18 0	7 12 0
1 12 0	1 16 0	2 0 0	2 6 0	2 12 0	2 18 0	3 4 0	3 10 0	3 18 0	4 6 0	4 14 0	5 2 0
1 18 0	2 2 0	2 6 0	2 12 0	2 18 0	3 4 0	3 8 0	3 12 0	4 0 0	4 8 0	4 16 0	5 4 0
1 8 0	1 12 0	1 16 0	2 0 0	2 4 0	2 8 0	2 12 0	2 16 0	3 0 0	3 4 0	3 6 0	3 10 0
7 2 0	7 14 0	8 8 0	9 0 0	9 6 0	10 7 0	11 12 0	13 1 0	15 0 0	16 10 0	17 18 0	19 18 0
7 6 0	7 19 0	8 13 0	9 8 0	9 14 0	10 11 0	12 5 0	13 19 0	15 18 0	17 16 0	18 19 0	21 8 0
7 13 0	8 6 0	9 0 0	9 15 0	10 1 0	10 18 0	12 12 0	14 6 0	16 9 0	18 11 0	19 13 0	21 17 0
7 18 0	8 11 0	9 7 0	10 2 0	10 8 0	11 5 0	13 3 0	15 1 0	17 4 0	19 6 0	20 12 0	23 0 0
3 1 0	3 5 0	3 11 0	3 16 0	3 19 0	4 5 0	4 14 0	5 2 0	5 15 0	6 8 0	6 15 0	7 17 0
3 8 0	3 13 0	4 0 0	4 6 0	4 11 0	5 0 0	5 13 0	6 5 0	7 1 0	7 16 0	8 7 0	9 7 0
3 12 0	3 18 0	4 7 0	4 16 0	5 1 0	5 11 0	6 4 0	6 16 0	7 13 0	8 10 0	9 4 0	10 8 0
4 4 0	4 10 0	4 19 0	5 8 0	5 13 0	6 3 0	7 0 0	7 17 0	8 18 0	10 0 0	10 12 0	11 16 0

Foot of the Vessel's Draft of Water.
the same proportion as between 22 and 23 feet.
respect of Vessels propelled by steam, and Vessels towed by Steam-Vessels, provided that if any distance for which any such Rate or Price may be payable, the reduction of one-fourth shall be propelled or towed.
Expenses.

[Continued.

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FOR PUTTING A PILOT ON BOARD A VESSEL.						
	60 Tons and under 150.	150 Tons and under 250.	250 Tons and under 400.	400 Tons and under 600.	600 Tons and under 1,000	1,000 Tons and upwards.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
From Hired Cutters or from the Shore ..	1 0 0	1 5 0	1 10 0	2 0 0	2 10 0	3 3 0
From the Corporation's Cutters	0 15 0	1 0 0	1 5 0	1 10 0	2 0 0	2 5 0

A Pilot taking charge of a Foreign Vessel, on board of which there may not be any individual qualified to interpret his orders, shall be authorized to employ a person to assist him as leadsman or interpreter; provided it be distinctly understood that the necessity for the employment of such person shall be proved to the satisfaction of the Corporation of Trinity House, in which case only the following rates shall be chargeable in addition to the regular Pilotage, viz.:—

For the whole run from Sea to Gravesend ... £2 10 0
,, Ditto from Gravesend to Sea ... 1 0 0

The additional rate, for intermediate portions of a foot, in the draft to be regulated as follows, viz.:—

For three inches and under ... ... No addition.
For more than three inches and under nine inches ... ... The medium between the two rates.
For nine inches and upwards ... The rate for the next foot.

For removing a Ship or Vessel from Moorings into a Dry or Wet Dock, or from one part of the River situated above Greenwich to another part of the River so situated; or for Mooring or unmooring a Vessel with two anchors; or for putting a Vessel alongside a Pier or Wharf and remaining while Cattle or Merchandize are being discharged or taken on board; or for Mooring Vessels laden with Petroleum in accordance with the Harbour Regulations;—or for attendance while adjusting Compasses, the following charge may be made in addition to the Pilotage, viz.:—

For a Ship under 300 tons £0 15 0
Ditto of 300 to 1,000 tons 1 0 0
Ditto *above* 1,000 tons 1 10 0

Approved by Her Majesty in Council,

At the Court at Windsor, the 17th day of May, 1882.

(*Signed*) C. L. PEEL.

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TIDE TABLES FOR JULY, 1882.

Also Ports of Reference for the Constants in the next Table.

Week Day.	Month Day.	LONDON BRIDGE.		HULL.		NORTH SHIELDS		LEITH.		DEVONPORT.		DOVER.		WESTON-SUPER-MARE.		LIVERPOOL.		GREENOCK.		QUEENSTOWN.		KINGSTOWN.		LONDONDERRY.		BREST.	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
		H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
S	1	1 35	1 57	6 7	6 30	8 5	8 26	2 1	2 23	5 22	5 45	10 54	11 19	6 36	7 1	11 3	11 26	11 50	—	4 42	5 5	10 54	11 15	7 48	8 6	3 28	3 50
S	2	2 19	2 41	6 53	7 16	8 47	4 10	2 45	3 7	6 8	6 31	11 44	—	7 25	7 48	11 49	—	0 14	0 38	5 28	5 51	11 38	—	8 29	8 50	4 12	4 34
M	3	3 5	3 26	7 39	8 2	4 33	4 56	3 28	3 50	6 54	7 16	0 9	0 33	8 10	8 32	0 12	0 35	1 2	1 25	6 14	6 37	0 1	0 24	9 11	9 32	4 57	5 20
Tu	4	3 49	4 13	8 25	8 48	5 19	5 43	4 13	4 37	7 38	8 0	0 57	1 22	8 54	9 15	0 58	1 21	1 48	2 11	7 0	7 24	0 47	1 11	9 53	10 15	5 43	6 6
W	5	4 36	5 0	9 13	9 36	6 7	6 31	5 1	5 25	8 22	8 44	1 47	2 12	9 36	9 57	1 44	2 7	2 34	2 57	7 48	8 12	1 35	2 0	10 39	11 4	6 30	6 54
Th	6	5 22	5 47	10 0	10 25	6 55	7 21	5 51	6 18	9 6	9 29	2 37	3 2	10 18	10 38	2 31	2 55	3 20	3 44	8 35	8 58	2 25	2 51	11 32	—	7 18	7 44
F	7	6 11	6 37	10 51	11 20	7 49	8 19	6 46	7 15	9 52	10 17	3 26	3 50	10 59	11 22	3 19	3 44	4 8	4 33	9 22	9 47	3 18	3 46	0 4	0 40	8 11	8 38
S	8	7 3	7 29	11 52	—	8 50	9 23	7 45	8 17	10 43	11 11	4 14	4 40	11 47	—	4 11	4 41	4 59	5 26	10 12	10 40	4 16	4 47	1 17	1 55	9 6	9 36
S	9	7 58	8 30	0 24	0 57	9 57	10 32	8 50	9 25	11 42	—	5 6	5 34	0 15	0 46	5 14	5 50	5 55	6 27	11 12	11 47	5 18	5 50	2 33	3 9	10 9	10 45
M	10	9 2	9 40	1 30	2 3	11 7	11 42	10 0	10 35	0 18	0 55	6 5	6 39	1 20	1 59	6 29	7 8	7 2	7 39	—	0 24	6 22	6 56	3 41	4 12	11 25	—
Tu	11	10 17	10 54	2 36	3 10	—	0 17	11 10	11 43	1 34	2 13	7 17	7 54	2 39	3 18	7 45	8 19	8 17	8 52	1 2	1 40	7 31	8 5	4 42	5 9	0 3	0 39
W	12	11 30	—	3 44	4 16	0 48	1 18	—	0 12	2 49	3 23	8 28	8 58	3 56	4 32	8 50	9 19	9 26	9 56	2 16	2 48	8 38	9 9	5 34	5 59	1 13	1 43
Th	13	0 4	0 34	4 46	5 12	1 45	2 10	0 39	1 5	3 53	4 21	9 27	9 54	5 5	5 35	9 45	10 9	10 25	10 52	3 18	3 46	9 38	10 4	6 24	6 49	2 11	2 35
F	14	1 0	1 26	5 36	5 59	2 34	2 56	1 30	1 53	4 47	5 11	10 19	10 43	6 1	6 25	10 31	10 53	11 16	11 39	4 10	4 33	10 25	10 45	7 14	7 37	2 57	3 18
S	15	1 48	2 10	6 21	6 42	3 16	3 36	2 14	2 34	5 32	5 52	11 5	11 27	6 47	7 8	11 13	11 33	—	0 1	4 54	5 15	11 4	11 23	7 57	8 16	3 39	3 59
S	16	2 29	2 49	7 2	7 22	3 55	4 14	2 53	3 11	6 11	6 30	11 48	—	7 28	7 46	11 53	—	0 22	0 42	5 35	5 54	11 42	mid.	8 33	8 49	4 19	4 37
M	17	3 7	3 25	7 41	7 58	4 32	4 49	3 28	3 45	6 48	7 4	0 7	0 25	8 3	8 19	0 12	0 29	1 1	1 19	6 11	6 27	—	0 17	9 5	9 20	4 53	5 9
Tu	18	3 43	4 0	8 14	8 30	5 6	5 23	4 1	4 17	7 19	7 34	0 43	1 1	8 35	8 50	0 46	1 2	1 35	1 51	6 43	6 59	0 34	0 51	9 35	9 51	5 25	5 41
W	19	4 16	4 34	8 46	9 2	5 40	5 57	4 34	4 51	7 49	8 4	1 19	1 37	9 5	9 20	1 18	1 34	2 7	2 23	7 15	7 31	1 8	1 26	10 7	10 23	5 57	6 14
Th	20	4 50	5 6	9 19	9 36	6 15	6 33	5 9	5 27	8 19	8 33	1 55	2 13	9 35	9 50	1 50	2 6	2 40	2 57	7 47	8 4	1 44	2 2	10 40	10 58	6 31	6 48
F	21	5 23	5 40	9 53	10 11	6 51	7 9	5 45	6 4	8 47	9 2	2 31	2 49	10 5	10 20	2 22	2 40	3 14	3 31	8 21	8 39	2 20	2 38	11 18	11 41	7 5	7 24
S	22	5 57	6 15	10 30	10 50	7 29	7 49	6 24	6 45	9 19	9 37	3 7	3 24	10 35	10 51	2 58	3 17	3 48	4 6	8 57	9 16	2 57	3 17	—	0 6	7 44	8 5
S	23	6 35	6 56	11 15	11 43	8 13	8 40	7 9	7 35	9 57	10 20	3 44	4 6	11 11	11 34	3 37	4 1	4 26	4 49	9 36	9 59	3 39	4 5	0 35	1 7	8 28	8 53
M	24	7 20	7 44	—	0 18	9 10	9 43	8 4	8 36	10 46	11 15	4 28	4 52	—	noon	4 20	5 0	5 14	5 42	10 26	10 58	4 33	5 4	1 41	2 18	9 21	9 54
Tu	25	8 13	8 47	0 44	1 16	10 18	10 54	9 10	9 48	11 50	—	5 20	5 52	0 32	1 8	5 35	6 14	6 13	6 48	11 34	—	5 37	6 10	2 55	3 30	10 31	11 9
W	26	9 24	10 5	1 50	2 23	11 29	—	10 22	10 56	0 30	1 10	6 26	7 2	1 44	2 22	6 53	7 30	7 24	8 0	0 10	0 47	6 43	7 17	4 1	4 31	11 48	—
Th	27	10 42	11 19	2 56	3 29	0 3	0 36	11 29	mid.	1 50	2 30	7 40	8 15	3 1	3 40	8 6	8 38	8 36	9 12	1 25	2 2	7 51	8 24	4 59	5 25	0 25	0 59
F	28	11 53	—	4 2	4 33	1 6	1 35	—	0 29	3 8	3 42	8 47	9 16	4 18	4 53	9 7	9 34	9 45	10 14	2 37	3 7	8 57	9 27	5 51	6 16	1 31	1 59
S	29	0 24	0 50	5 1	5 26	2 1	2 25	0 55	1 20	4 11	4 38	9 44	10 10	5 2	5 51	9 58	10 22	10 41	11 7	3 34	4 0	9 54	10 17	6 41	7 5	2 25	2 48
S	30	1 16	1 40	5 50	6 14	2 48	3 10	1 44	2 7	5 4	5 29	10 36	11 2	6 18	6 44	10 46	11 10	11 33	11 58	4 25	4 50	10 39	11 1	7 29	7 53	3 11	3 34
M	31	2 5	2 26	6 38	7 2	3 32	3 54	2 30	2 52	5 54	6 18	11 28	11 52	7 9	7 32	11 34	11 57	—	0 22	5 14	5 38	11 23	11 45	8 15	8 36	3 57	4 20

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TIDAL CONSTANTS

For Various British, Irish, and European Ports.

By applying the Tidal Constant of the place, according to its sign (+ *add*, − *sub.*), to the time of high water on the given day at the port of reference, you have the time of high water at the place sought.

Place.	Constant.	Port of Reference.
	H. M.	
Aberdeen	−1 17	Leith
Aberystwyth	−3 52	Liverpool
Alderney	+2 59	Brest
Antwerp	+5 13	Dover
Arbroath	−0 42	Leith
Arcachon	+0 50	Brest
Arklow	−2 25	Kingstown
Ayr	−0 18	Greenock
Banff	−1 49	Leith
Bantry harbour	−1 14	Queenstown
Barnstaple bridge	−0 26	Weston-s.-Mare
Bayonne	−0 2	Brest
Beachy head & Rye bay	+0 8	Dover
Beaumaris	−0 51	Liverpool
Belfast	+2 42	Londonderry
Berwick	−1 5	N. Shields
Blyth	−0 8	N. Shields
Bordeaux	+3 3	Brest
Boulogne	+0 13	Dover
Bridport	+0 22	Devonport
Bristol & King Road	+0 19	Weston-s.-Mare
Cadiz	−2 2	Brest
Caernarvon	−1 56	Liverpool
Calais	+0 37	Dover
Campbellton	−0 23	Greenock
Cardiff	+0 2	Weston-s.-Mare
Cardigan bar	−4 22	Liverpool
Carlingford bar	−0 10	Kingstown
Chatham	−0 47	London
Cherbourg	+4 2	Brest
Coleraine	−1 37	Londonderry
Coquet Road	−0 23	N. Shields
Cordouan Tower	−0 10	Brest
Cowes (West)	−0 27	Dover
Crinan	+4 41	Greenock
Cromarty	−2 21	Leith
Dartmouth	+0 33	Devonport
Deal & Downs	+0 3	Dover
Dieppe	+7 19	Brest
Donaghadee	+0 3	Kingstown
Donegal harbour	+0 17	Queenstown
Douglas & Ramsay	−0 11	Liverpool
Dublin bar	+0 2	Kingstown
Dundalk	−0 16	Kingstown
Dungeness	−0 27	Dover
Dunkerque	+0 56	Dover
Exmouth	+0 38	Devonport
Falmouth	−0 46	Devonport
Fecamp	+6 57	Brest
Ferrol	−0 47	Brest
Flamborough head	−1 59	Hull
Fleetwood	−0 12	Liverpool
Folkestone	−0 5	Dover
Fowey	−0 29	Devonport
Flushing	+1 42	Dover
Galway bay	−0 26	Queenstown
Gibraltar	−1 27	Brest
Glasgow (Port)	+0 10	Greenock
Gloucester	+2 51	Weston-s.-Mare
Granville	+0 26	Brest
Gravesend	−0 48	London
Grimsby (Great)	−0 53	Hull
Guernsey (St. Peter)	+2 50	Brest
Hartlepool	+0 5	N. Shields
Harwich	−1 52	London
Havre	+6 4	Brest
Helgoland	+0 21	Dover
Holyhead	−1 12	Liverpool
Holy Island harbour	−0 53	N. Shields
Honfleur	+5 42	Brest
Inverness	−1 59	Leith

Place.	Constant.	Port of Reference.
	H. M.	
Jersey (St. Helier)	+2 38	Brest
Kinsale	−0 18	Queenstown
Lerwick (Shetland)	−3 47	Leith
Limerick	+1 15	Queenstown
Lisbon Bar	−1 17	Brest
Littlehampton	+0 24	Dover
Llanelly bar	−0 38	Weston-s.-Mare
Lowestoft	−4 1	London
Lynn & Boston Deep	−0 29	Hull
Margate	−2 18	London
Maryport	+0 3	Liverpool
Milford Haven entr.	−0 58	Weston-s.-Mare
Montrose	−0 52	Leith
Morlaix	+1 6	Brest
Needles point	−1 26	Dover
Newcastle	+0 23	N. Shields
Newhaven	+0 39	Dover
Newport	+0 16	Weston-s.-Mare
Nieuport	+1 6	Dover
Nore	−1 28	London
Orfordness	−2 48	London
Oporto	−1 17	Brest
Ostende	+1 13	Dover
Padstow	−1 41	Weston-s.-Mare
Peel, Isle of Man	−0 15	Liverpool
Pembroke Dock	−0 42	Weston-s.-Mare
Penzance	−1 13	Devonport
Peterhead	−1 43	Leith
Piel harbour, Barrow	−0 18	Liverpool
Plymouth breakwater	−0 6	Devonport
Poole	−2 2	Dover
Port Carlisle	+0 47	Liverpool
Portland breakwater	+1 18	Devonport
Port Patrick	−0 58	Greenock
Portsmouth	+0 29	Dover
Ramsgate	−2 19	London
Rotterdam	+4 33	Dover
Santander	−0 17	Brest
Scarborough	+0 48	N. Shields
Selsea bill	+0 33	Dover
Sheerness	−1 21	London
Shoreham	+0 22	Dover
Sligo bay	+0 17	Queenstown
Southampton	−0 42	Dover
Spurn point	−1 3	Hull
St. Ives	−2 10	Weston-s.-Mare
St. Malo	+2 18	Brest
St. Mary (Scilly)	−1 16	Devonport
St. Nazaire	−0 7	Brest
Stornoway	+6 38	Greenock
Stromness (Orkneys)	−5 17	Leith
Sunderland	−0 1	N. Shields
Swansea bay	−0 53	Weston-s.-Mare
Tay bar	−0 11	Leith
Tees bar	+0 22	N. Shields
Tenby	−1 12	Weston-s.-Mare
Thurso	−5 49	Leith
Torbay	+0 17	Devonport
Tralee bay	−0 58	Queenstown
Ushant (Ouessant)	−0 15	Brest
Valentia harbour	−1 19	Queenstown
Waterford	+0 19	Queenstown
Westport	−0 4	Queenstown
Wexford	+2 20	Queenstown
Whitby	+0 22	N. Shields
Whitehaven	−0 9	Liverpool
Wick	−2 55	Leith
Wicklow	−0 41	Kingstown
Workington	−0 19	Liverpool
Yarmouth road	−4 43	London
Youghall	+0 13	Queenstown

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MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
211	English Channel—Needles Light	Alteration in character.
212	England—Thames Entrance	New channel to be buoyed.
213	„ West Coast—St. Ives	Re-exhibition of harbour lights.
214	„ Bristol Channel	Alteration in buoyage.
215	Scotland — Outer Hebrides — Monach Light	Low light discontinued.
216	Ireland—South Coast—Cork Harbour Approach—Daunt Rock Light-vessel	Temporarily replaced by another vessel.
217	„ „ Cork Harbour	Buoys to mark foul ground.
218	„ N.W. Coast—Donegal Harbour —Blind Rock	Buoy to mark rock.
219	North Sea—Schelde River	New lights.
220	„ East Schelde — Schouwen Island	Provisional light exhibited.
221	„ Weser River Entrance	Pilots for Jade River.
222	„ Jutland—West Coast—Fanö Island—Nordby Harbour Lights	Period of exhibition extended.
223	Norway — South Coast — Skagerrak — Christiania Fiord—Homlungen Islet	Alteration in arc of light.
224	Baltic Entrance — Sound — Mollelei Harbour	Temporary discontinuance of light.
225	„ Little Belt—Flensborg Fiord—Kalk ground	Light-vessel temporarily wfthdrawn.
226	„ Great Belt—Zealand—As ness Bank	Beacon buoy established.
227	Baltic—Prussia — Stettin — Kaiserfahrt Light-vessel	Height of lights altered.
228	„ Sweden—Korso Islet and Sandhamn	Korso light to be discontinued; Sandhamn light to be altered.
229	„ Bothnia Gulf — Westra Finngrund Light-vessel	Visibility of light; new fog-signal.
230	„ „ Russia — Storkalle grund Light-vessel	Alteration in colour.
231	France — North Coast — Seine River — La Roque Light	Colour of light.
232	„ West Coast—Loire-Inférieure—La Turbal	New harbour light.
233	Spain—West Coast—Vigo Bay—Monteferro Shoal	Position of Buoy.
234	Mediterranean — Adriatic — Cattaro Gulf—Fort Mamula	Re-exhibition of light.
235	„ Egypt—Cape Brulos	Position of lighthouse.
236	North Atlantic—Cape Verde Islands—St. Jago—Porto Praya	Quail Island light discontinued.
237	Africa—West Coast—Cape Palmas	Buoys removed.
238	„ „ Axim Bay—Hoeven Rock	Position of shoal.
239	„ East Coast—Zanzibar—English Pass	Discovery of shoal.
240	India—Buoyage	System in Indian waters.
241	„ West Coast—Bombay	Alteration in time signal.
242	„ Bay of Bengal—Calcutta	Time signals.
243	„ „ Hooghly River Approaches	Alteration of colour and distinguishing marks of light-vessels.

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MONTHLY ABSTRACT OF NAUTICAL NOTICES—*Continued.*

No.	PLACE.	SUBJECT.
244	BAY OF BENGAL—Martaban Gulf—Krishna Shoal Light-vessel	Fog gun; light-vessel altered in colour.
245	EASTERN ARCHIPELAGO—Java—Joana	New harbour light.
246	CHINA SEA—Formosa Island—South Cape	Provisional light; intended fixed light.
247	WEST INDIES—Barbados—Long Shoal	New bell buoy.
248	UNITED STATES — South Carolina — Charleston Harbour —Fort Sumter	New fog bell.
249	CANADA—Prince Edward Island—Hillsborough Bay—St. Peter's Island	Light altered in colour.
250	„ „ Bedeque (Summerside) Harbour —Indian Spit	Alteration in light.
251	„ River St. Lawrence — Isle of Orleans—Port St. John	Light altered in colour.

NAUTICAL NOTICES.

All Bearings Magnetic, unless otherwise stated.

211.—ENGLISH CHANNEL.—*Needles Light. — Alteration in Character.*—It is intended early in the month of September, 1882, to alter the present character of the Needles light, so that it shall thereafter be an occulting light, with an eclipse of three *seconds'* duration *every half-minute*. Further notice will be given when the above alteration is effected.

212.—ENGLAND. — *Entrance to the River Thames. — New Channel.*—For the greater convenience of navigation, especially of large vessels entering or departing from the river Thames, it has been decided to buoy the channel hitherto known as the *Bullock* channel, and thenceforth to distinguish it by the name of *The Duke of Edinburgh's channel*. Also, a beacon will be erected on the N.E. part of the Shingles sand, surmounted by a St. Andrew's Cross. So soon as the buoys have been placed, further notice will be given.

213.—ENGLAND.—*West Coast.—St. Ives.—Re-exhibition of Harbour Lights.*—With reference to Notice in 1881, on the discontinuance of the red light on the outer pier, also of the tidal white light on the inner pier, at St. Ives; these lights are now

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re-exhibited. The red light is now shown 125 feet within the extremity of the outer wooden pier—about 60 feet within which extremity is a gap, locally known as Fisherman's Gap, about 50 feet in width—this portion of the pier was washed away on 19th January, 1881. The white light shown from the end of the inner pier will be exhibited from 1st September to 30th April, when there is 10 feet water at the inner pier head.

Note.—Vessels entering the harbour at night should pass at least 200 feet south eastward of the red light on the outer pier.

214.—ENGLAND.—*Bristol Channel.—Buoyage.—Nash, Welsh Hook, and Culver Sands.*—The following alterations have been made in the positions of the buoys marking the Nash and Welsh Hook sands, viz.:—

SOUTH EAST NASH has been moved 4 cables S.E. ¼ E. of its former position, and now lies in 5 fathoms at low water spring tides, with the following marks and bearings, viz.:—Nash high lighthouse tower, nearly its height open north of the low lighthouse, S.E. by E.; Dunraven summer house, its width open east of a round tree, the westernmost on high land, N.E. by E.; East Nash buoy, S.E. ¾ E., distant $2\frac{6}{10}$ths miles; S.W. Nash buoy (new position), N.W. by W., distant 2 miles.

SOUTH WEST NASH has been moved 1 mile S.E. ¾ E. of its former position, and now lies in 5½ fathoms at low water spring tides, with the following marks and bearings, viz.:—Nash high lighthouse tower, its height open north of the low lighthouse, S.E. by E.; Scar house in line with Rhwchiwyns point, North Ely.; S.E. Nash buoy (new position), S.E. by E., distant 2 miles.

WELSH HOOK BUOY has been moved 4 cables W. ½ S. of its former position, and now lies in 4½ fathoms at low water spring tides, with the following marks and bearings, viz.:—The trees on Bleadon hill in line with Clevedon old church, S.W. by S. Sly.; the white hut for leading light near Avonmouth just open of Portishead point, E. ½ S.; English and Welsh Grounds light-vessel, W. ½ S., distant $4\frac{4}{10}$ths miles; S.W. Patch buoy, W. by N. Wly., distant $5\frac{3}{10}$ths miles; Middle Hook buoy, W. by N. ¼ N., distant $2\frac{2}{10}$ths miles; Newcome buoy, East Nly., distant $3\frac{5}{10}$ths miles.

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It is also intended at an early date, to move the West Nash buoy 6½ cables S.E. by E. from its present position, and to place a new buoy on the north side of the Culver sand, about midway between those now in position marking that danger. Further notice will be issued relative to these two buoys when the changes have been effected.

215.—SCOTLAND.—*West Coast.—Monach Low Light, off the West Coast of the Outer Hebrides or Western Isles of Scotland, to be discontinued.*—The red fixed light exhibited from the window in tower below the principal light, will on the 1st July, 1882, be extinguished, and will not again be exhibited. The principal light will continue to be exhibited as at present.

216.—IRELAND. — *South Coast. — Cork Harbour Approach.—Daunt Rock Light-Vessel temporarily Replaced.*—The Daunt rock light-vessel, southern approach to Cork harbour, having been withdrawn for repairs, is temporarily replaced by a light-vessel with one mast and jigger mast, instead of three masts. *Variation*, 18¼° *W.*

217.—IRELAND.—*South Coast.—Cork Harbour.—Buoys marking position of Wreck.*—With reference to Notice of the wreck of the iron barque *Helenslea*, sunk by collision in the entrance of Cork harbour, and then lying in 8 fathoms, S.W., 480 yards from the western harbour rock buoy ; the wreck has been destroyed by explosives, and there is now a minimum depth of 41 feet, at low water spring tides, over the remains of the vessel—the wreck-marking vessel has therefore been withdrawn, but the buoy originally placed 20 fathoms west of the wreck is retained in position, and a second wreck buoy is now moored about 50 fathoms E.N.E. of it, in order to mark the eastern portion of the remains. Between these buoys the ground is foul. Mariners should avoid anchoring in the vicinity. *Variation*, 22¾° *W.*

218.—IRELAND.—*N.W. Coast. — Donegal Harbour. — Buoy South-eastward of Blind Rock.*—With reference to Notice in March, 1882, that the perch on Blind rock, western side of entrance to Donegal harbour, was washed away during the gale in October, 1881, and had not been replaced ; on or about 10th June, 1882, a *conical* buoy (second class) will be moored in 4 fathoms at low

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water spring tides, 50 yards S.E. of Blind rock, and maintained in that position until the perch shall have been replaced. Vessels navigating the channel should pass south-eastward of this buoy. *Variation*, 23½° *W.*

219.—North Sea.—*Schelde River.—Fixed Lights near Forts De Perle and Pipe De Tabac.*—On 21st January, 1882, a *fixed white* light was exhibited on the dike near Fort de Perle (Parel); as also on the point of the Draaiende Sluis at Fort Pipe de Tabac, left bank of Schelde river, below Antwerp.

220.—North Sea.—*East Schelde.—Schouwen Island.—Revolving Light Discontinued, Provisional Light Exhibited.*—With reference to Notice, No. 154, p. 384, the revolving light is now discontinued, and the provisional light exhibited. This light shows a *fixed white* light, varied by a flash in the following order—*fixed white* for a period of *sixty seconds*, eclipse of *thirteen and a-half seconds*, *flash three seconds*, followed by eclipse of *thirteen and a-half seconds;* elevated 171 feet above high water, and visible seaward between the bearings of N. by E. and W. by S. ¾ S. Further notice will be given, of the exact date on which this provisional light will be replaced by the permanent light. *Variation*, 16¼° *W.*

221.—North Sea.—*Weser River Entrance—Weser Light-Vessel.—Pilots for Jade River.*—As long as pilots for Jade river are on board Weser light-vessel, the flag of the Imperial German pilot-vessels is hoisted on the mainmast below the day mark.

222.—North Sea.—*Jutland.—West Coast.—Fanö Island.—Nordby Harbour Lights—Period of Exhibition Extended.*—The two harbour lights at Nordby (shown from the extremity of the harbour pier, and on Pakhus or Pakhuus point), and which kept in line lead to Fanö Lo, will in future be exhibited yearly from 1st September till 1st June, instead of as previously from 1st September till 1st April.

223.—Norway.—*South Coast.—The Skagerrak.—Christiania Fiord.—Homlüngen Islet Light—Alteration in Arc of Visibility.*—This light now shows *white* between the bearings of E. by S. ¼ S., through north, and W. by N. ¾ N. (this bearing leads southward of Pillaren), and *red* between E. by S. ¼ S. and E.S.E. *Variation*, 12¾° *W.*

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224.—Baltic Entrance.—*The Sound.—Möllelei Harbour Light.—Temporary Discontinuance.*—On account of repairing the light-house, the harbour light at Möllelei (Mölle) will not be exhibited from 20th April till 1st August, 1882.

225.—Baltic Entrance.—*Little Belt.—Flensborg Fiord.—Kalk Ground Light-Vessel—Temporary Withdrawal.*—On account of repairs, Kalk ground light-vessel will be withdrawn from her station on the south side of Flensborg fiord entrance, on 15th June, 1882, and will be replaced in position on 15th July, 1882. A buoy, painted red, will mark the position of the light-vessel during withdrawal; the channel is northward of this buoy.

226.—Baltic Entrance. — *Great Belt. — Zealand.—Beacon Buoy Westward of As ness Bank.*—A beacon buoy, with white perch and three brooms turned upwards, has been placed in 4½ fathoms water, westward of the bank (Asnaes Flak), extending from As ness, west coast of Zealand.

227.—Baltic.—*Prussia.—Approach to Stettin. — Kaiserfahrt Light-Vessel.—Height of Lights Altered.*—The height of the two lights shown from Kaiserfahrt light-vessel, approach to Stettin, has been altered—the upper light is now elevated 31 feet above the sea, the lower light 21 feet.

228.—Baltic.—*Sweden.—Intended Discontinuance of Korsö Islet Light, and Alteration in Sandhamn Light.*—It is intended shortly to discontinue the light on Korsö islet, and to make alteration in the light on Sando island, Sandhamn entrance to Stockholm.

229.—Baltic.—*Gulf of Bothnia.—Westra Finngrund Light-Vessel.—Visibility of Light, Fog-Signal.*—With reference to Notice in 1881, on placing a light-vessel, showing a temporary light, on the south-western edge of Westra Finngrund bank; the present light (fixed red) should be visible from a distance of 8 miles. Also, a fog-signal has been established on board Westra Finngrund light-vessel, and during thick or foggy weather, the signal, worked by steam, will give *five* short signals *every minute*.

230.—Baltic.— *Gulf of Bothnia.—Russia. — Storkalle Grund Light-Vessel.—Alteration in Colour.*—The vessel is now painted red, instead of black as previously.

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231.—FRANCE.—*North Coast.—Seine River,—Colour of La Roque Bank Light.*—The light exhibited to mark the extremity of La Roque bank, left shore of Seine river, is a *fixed white* light, not fixed red as previously stated.

232.—FRANCE.—*West Coast.—Loire-Inférieure.—Harbour Light at La Turbal.*—On the 15th June, 1882, a light would be exhibited from a lantern on iron posts, erected close to the life-boat refuge house at La Turbal (Turballe). The light will be a *fixed white* light, elevated 29 feet above high water (20 feet above the ground), and visible from a distance of 7 miles. Position, lat. 47° 20′ 55″ N., long. 2° 30′ 50″ W.

233.—SPAIN.—*West Coast.—Vigo Bay.—Position of Monteferro Shoal Buoy.*—Monteferro shoal buoy, *conical*, painted red and surmounted by a white globe, is moored in 8 fathoms water, about three-quarters of a cable northward of Monteferro shoal, southern side of entrance to Vigo bay.

234.—MEDITERANEAN.—*Adriatic.—Gulf of Cattaro Entrance.—Re-exhibition of Fort Mamula Light.*—With reference to Notice in July, 1881, on the temporary discontinuance, pending improvements in the illuminating apparatus, of the light on Fort Mamula, Rondoni rock, at the entrance to Gulf of Cattaro ; the light is now re-exhibited. This light, shown from a stone turret (12 feet high) in the centre of Fort Mamula, is a *fixed red* light, elevated 110 feet above high water, and visible from a distance of 4 miles.

235.—MEDITERRANEAN.—*Egypt.—Position of Cape Brulos Light-house.*—The Cape Brulos lighthouse is situated in approximately —lat. 31° 35′ 20″ N., long. 31° 5′ 20″ E.

236.—NORTH ATLANTIC.—*Cape Verde Islands.—St. Jago Island. —Porto Praya.—Discontinuance of Quail Island Light.*—The light on the south point of Quail island, Porto Praya, is discontiuued.

Note.—The light (fixed red) shown from the Custom-house mole at Porto Praya, should be visible from a distance of ten miles.

237.—AFRICA.—*West Coast.—Cape Palmas.—Buoys Removed.* —The spar buoy S.W. of Outer rock, also the can buoy near Yoruba rock, in the vicinity of Cape Palmas, have been removed, and probably will not be replaced.

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238.—AFRICA.—*West Coast.—Axim Bay.—Position of Hoeven Rock.*—From an examination lately made by H.M.S. *Firefly* of the shoal ground in Axim bay, a shoal of $3\frac{3}{4}$ fathoms was found, with uneven bottom of coral, mud, and sand, lying with the following bearings and distance:—Acrumassi point, N. 8° E.; Fort St. Anthony, Axim, S. 86° E., distant $1\frac{2}{10}$ mile; south extreme of Pepré point, S. 45° E. As this examination gave no indication of shoal ground near the charted position of Hoeven rock, it is considered that the shoal ground found by him is identical with that danger, and that the depth over it may be less than 2 fathoms, as had been reported to exist on the Hoeven rock. *Variation*, 19° *W.*

239.—AFRICA.—*East Coast.—Zanzibar.—Shoal in English Pass.*—Commander Mather Byles, H.M.S. *Seagull*, reports the existence of a shoal (over which that vessel passed on 9th March, 1882), lying near the fairway of English pass, northern approach to Zanzibar harbour. This shoal (*Seagull shoal*), about 80 yards long in a north and south direction and 40 yards in width, consists of black sand and coral, with a least depth of 12 feet at low water spring tides over a coral head, and $3\frac{1}{2}$ fathoms close around; it lies with the following bearings and distances:—Large house on Bet-el-Rás, S.S.E. $\frac{1}{8}$ E.; west extreme of Chango island, S.W. $\frac{1}{4}$ W., distant $2\frac{1}{4}$ miles; white, square castellated house north of Bet-el-Rás, E. $\frac{3}{4}$ N., distant $1\frac{1}{4}$ mile. These bearings place Seagull shoal in lat. 6° 5′ 10″ S., long. 39° 11′ 15″ E. *Variation*, $10\frac{1}{4}$° *W.*

240.—INDIA.—*System of Buoyage in Indian Waters.*—The following uniform system of buoyage in Indian waters is now being gradually introduced, as it becomes necessary to replace existing buoys, in all ports and their approaches, Bombay harbour and Hooghly river excepted.—The side of the channel is to be considered starboard or port, with reference to the entrance to any port from seaward. The entrances of channels or turning points shall be marked by *conical* buoys, with staff carrying globe, or triangle, or basket—*black* buoys on starboard-side of the channel, *red* buoys on port-side. The sides of channels shall be marked as follows:—*Conical* buoys, painted *black*, shall mark the starboard-

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side; *can* buoys painted *red* shall mark the port-side. Where a middle ground exists in a channel, each end of it shall be marked by a *conical* buoy, coloured *red* on one side, *black* on the other, with a double beacon, either of basket and globe, or basket and triangle, as may be desirable. In case of this middle ground being of such extent as to require intermediate buoys, they shall be of shapes and colours as on the sides of a channel. Wrecks shall continue to be marked by *nun* buoys coloured *green*. Fairway buoys shall be *conical*, and chequered *black* and *white*. Where channels are named in large rivers, as the Hooghly, the initial letter of the channel's name, preceded by the letter L for Lower, C for Central, or U for Upper, may be painted on the buoys—thus, L.E. for Lower Eden; C.E. for Central Eden, &c. Isolated sunken rocks shall be marked by *conical* buoys coloured *red*.

241.—INDIA.—*West Coast.—Bombay.—Alteration in Time Signal.*—From 1st December, 1881, Madras mean time would be held to be the official time for all purposes at Bombay. The time ball at Bombay is now dropped at $1^{h.}\ 0^{m.}\ 0^{s.}$ p.m. Madras mean time—equivalent to $19^{h.}\ 39^{m.}\ 0{\cdot}6^{s.}$ Greenwich mean time.

242.—INDIA.—*Bay of Bengal.—River Hooghly.—Time Signals at Calcutta.*—The ball is now dropped daily at One p.m., Calcutta mean time (or $19^{h.}\ 6^{m.}\ 41{\cdot}3^{s.}$, mean time at Greenwich), at both the Semaphore tower in Fort William, and at the Port Commissioner's Office, Calcutta. The balls are hoisted close up, as preparatory, about 5 minutes before signal.

243.—INDIA—*Bay of Bengal.—Hooghly River Approaches.—Alteration of colour and Distinguishing marks of Light-Vessels.*—From the 1st November, 1882, the whole of the light-vessels marking the approaches to the Hooghly river will be painted *red*, and the following distinguishing marks will be displayed at the mastheads:—

(1.) The Pilots' Ridge light-vessel, which now carries at the main a black ball with white horizontal band, will display a *black ball at the foremast head.*

(2.) The distinguishing mark of the Eastern Channel light-vessel will remain as at present, *i.e.*, a *black ball at the mainmast head.*

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(3.) The Mutlah light-vessel, which now carries at the main a red ball with white horizontal band, will display a *black ball at both fore and mainmast heads.*

(4.) The "Intermediate" light-vessel, which now carries a double triangle at the main, will display a *black ball at the fore and mizenmast heads.*

(5.) The distinguishing marks for the Gaspar light-vessels will remain as at present, *i.e.*, the Lower Gaspar, a *white flag at the main;* and the Upper Gaspar, a *white flag with red star.*

Note.—The Mutlah light-vessel will, from the 1st November, 1882, be moored two miles due south of its present position.

244.—Bay of Bengal.—*Gulf of Martaban.—Krishna Shoal Light-Vessel.—Signal-gun during thick or foggy weather.—Alteration in colour of Light-Vessel.*—In future a gun will be fired from the Krishna shoal light-vessel every half-hour during thick or foggy weather, for the purpose of warning approaching vessels.

Note.—The Krishna shoal light-vessel is now painted *red*, instead of *yellow*, as formerly.

245.—Eastern Archipelago.—*Java.—North Coast.—Harbour Light at Joana.*—With reference to Notice in 1877, on the proposed establishment of a harbour light at Joana (Djoewana), north coast of Java; the light is now exhibited. It is a *fixed white* light, elevated 49 feet above high water, and visible from a distance of about 8 miles; it is shown from an iron post, with keeper's dwelling square in shape and constructed of iron; situated about one mile inland, and not visible from the road. Position, lat. 6° 40′ 55″ S., long. 111° 10′ 20″ E.

246.—China Sea.—*Formosa Island.—South Cape—Provisional Light Exhibited, intended Fixed Light.*—Since December, 1881, a provisional light has been exhibited, pending the completion of a lighthouse, on South cape or Nan-sha, the southern extremity of Formosa island; it is a *fixed red* and *white* light, visible from a distance of about 6 miles. A lighthouse (expected to be completed in February, 1883), is in course of construction on South cape, from which will be exhibited a *fixed* light showing *white* seaward between the bearings of S. 83° E. and S. 17° W., and *red* in other directions; it will be elevated 210 feet above high water, and

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should be visible from a distance of about 20 miles. The lighthouse, circular in shape, will be 60 feet in height; and in order to be protected from possible attacks by the natives, will, with the adjoining dwellings, be constructed for defence, the whole being surrounded by a wall. Position approximate, lat. 21° 54′ 30″ N., long. 120° 51′ 0″ E. *Variation*, ½° *W.*

247.—West Indies.—*Barbados.—West Coast.—Bell Buoy on Long Shoal.*—A *bell* buoy has been placed to mark the shoal (*Long shoal*) north-westward of Pelican shoals, west coast of Barbados. The buoy, painted black, is moored in 4 fathoms water about 6 cables from the shore, with the hospital on Pelican island bearing S.E. ¼ S. Vessels should pass westward of this buoy. *Variation*, ¼° *E.*

248.—United States.—*South Carolina.—Fog-Bell on Fort Sumter, Charleston Harbour.*—A fog-bell has been established on the N.E. face of Fort Sumter, Charleston Harbour, close to the lighthouse. During thick and foggy weather this bell will strike two blows in quick succession, at intervals of 15 *seconds.*

249.—Canada.—*Prince Edward Island.—Hillsborough Bay.—St. Peter's Island Light.—Alteration in Colour.*—On the opening of navigation in 1882, the following alteration would be made in the colour of the light exhibited on the western extremity of St. Peter's island, west side of entrance to Charlottetown harbour, Hillsborough bay. The light will be a *fixed red* light, instead of fixed white as previously. This alteration has been made to prevent confusion with Blockhouse point and Prim point lights.

250.—Canada.—*Prince Edward Island.—Bedeque* (*Summerside*) *Harbour.—Alterations in Indian Spit Light.*—On the opening of navigation in 1882, the following alterations would be made in the light exhibited on Indian spit, south side of entrance to Bedeque (Summerside) harbour. The light (*fixed*) now shows *white* between the direction of Sea-Cow head and the southern extremity of Muscouche spit, as well as towards the harbour; and *green* over Muscouche spit and bank, or between the bearings of E. by N. ¼ N. and E.S.E. Vessels approaching from the N.W. can steer towards the harbour as soon as Indian spit white light is opened, and after leaving it on the starboard-hand, the buoys and the light

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on the railway wharf will guide. Vessels outside the light, working in or out, should tack immediately the white light is lost sight of. *Variation*, $23\frac{3}{4}°$ *W.*

251.—Canada.—*River St. Lawrence.*—*Isle of Orleans.*—*Port St. John Light.*—*Alteration in Character*—On the opening of navigation in 1882, the following alteration would be made in the character of the light exhibited on the wharf at port St. John, S.E. side of Isle of Orleans. The light is a *fixed white* light, instead of revolving white as previously.

Hydrographic Notices recently Published by the Hydrographic Office, Admiralty, 1882.

No.

5.—Africa Pilot, Part I. Relating to Elmina bay.

6.—Coast of Ireland, Part II. Relating to the west coast of Ireland.

7.—West Coast of Hindostan Pilot. Relating to Minikoi island.

8.—Africa Pilot, Part I. Relating to cape Juby and Ouro river, and to Lanzarote island, Canary group.

9.—China Sea Directory, Vol. II. Relating to Macclesfield bank, and to the Paracel islands.

10.—West India Pilot, Vol. I. Relating to Greytown harbour.

11.—China Sea Directory, Vol. II. Relating to the north-west coast of Borneo, Saigon river, and Tong-King gulf.

12.—South America Pilot, Part I. Relating to San Francisco harbour, Santa Catharina channel, Rio de la Plata, Parana river, Falkland Islands, and Para river.

13.—China Sea Directory, Vol. II. Relating to Tong-King gulf, Hainan strait, and east coast of China.

14.—Africa Pilot, Part III. Relating to Delagoa bay, Inhambane river, and Mozambique river.

15.—Bay of Bengal. Remarks on the voyage of H.M.S. *Ready* from Rangoon to Thayetmyo and back.

16.—Newfoundland Pilot. Relating to the coasts of Newfoundland and Labrador.

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Books.

	s.	d.
The Mediterranean Pilot, Vol. IV. Comprising the Archipelago with the adjacent coasts of Greece and Turkey; including also the island of Candia or Crete. 1882.	3	6
The Gulf of 'Aden Pilot. Sokótra and adjacent islands, Somáli and Arabian coasts in the gulf of 'Aden and the east coast of Arabia. Second edition, 1882.	1	0

OUR OFFICIAL LOG.

Official Inquiries at Home, 1882.

1354. *Leon Crespo,* ship; built at Kelvinhaugh, 1865; owned by Mr. J. José; tonnage, 689; Swansea to Tocapilla; coals; lost by fire, January 25, 1882. Inquiry held at Swansea, May 8, 1882, before Rothery, Wreck Commissioner; Castle and Kennedy, N.A. Fire caused by spontaneous combustion. Master in some measure to blame for not making arrangements to ascertain from time to time the temperature of the hold.

1355. *Noah,* s.s.; owned by Mr. O. Jones and another; tonnage, 15; engaged towing, &c.; foundered, the result of an explosion which took place on board, April 7, 1882, when loss of life ensued. Inquiry held at Beaumaris, May 4, 1882, before Rothery, Wreck Commissioner; Aplin and Ravenhill, N.A. Casualty caused by an explosion of the boiler.

1356. *St. Vincent,* barque; built at Jersey, 1867; owned by Mr. T. Scrutton; tonnage, 462; St. Vincent to Scilly; sugar; lost through striking on the Spanish Ledges, Scilly Isles, April 24, 1882. Inquiry held at Westminster, May 13, 1882, before Rothery, Wreck Commissioner; Ward and Ronaldson, N.A. Pilot in charge to blame.

1360. *Consent,* s.s.; built at Sunderland, 1879; owned by Mr. J. Westoll; tonnage, 955; the Tyne to Genoa; coals; stranded on Middle Cross Sand, April 15, 1882. Inquiry held at North Shields, May 16, 1882, before Spence and Jackson, Judges;

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Ward and French, N.A. Accident due to vessel being kept on a S. ½ E. course for too long a time. Master and second mate in default; reprimanded.

1361. *Mallard*, barque; built at Whitehaven, 1857; owned by Mr. W. Murray; tonnage, 603; Pensacola to Falmouth; timber; capsized off Scilly, when loss of life ensued. Inquiry held at Hull, May 20, 1882, before Twiss, Judge; Hight and Hyde, N.A. Casualty caused by stress of weather. Vessel capsized and was abandoned. Derelict afterwards towed into Plymouth.

1357. *Pearl of India*, barque; built at St. John's, N.B., 1864; owned by Mr. J. Hendry and others; tonnage, 1,256; Quebec to United Kingdom; timber; supposed to have foundered at sea. Inquiry held at Greenock, May 17, 1882, before Neill and Ross, Justices; Powell and Knox, N.A. The vessel having left Quebec in perfectly seaworthy condition, it can only be conjectured that she foundered in one of the fearful gales which prevailed in the Atlantic about that time.

1364. *Alice and Kate*, schooner; built at Saundersfoot, 1880; owned by Mr. L. J. Murphy; tonnage, 80; Dublin to Newport, (Mon.); ballast; lost off Lavernock Point, Bristol Channel, April 28, 1882. Inquiry held at Cardiff, May 20, 1882, before Jones, Judge; Kennedy and Rees, N.A. Loss due to vessel striking a sunken wreck.

1365. *Peckforton Castle*, barque; built at Wallsborough, U.S., 1855; owned by Mr. J. M. Way; tonnage, 1,088; Mexillones to Hamburg; guano; abandoned at sea, January 24, 1882. Inquiry held at Liverpool, May 19, 1882, before Rothery, Wreck Commissioner; Parfitt and Vaux, N.A. Loss caused from ship taking fire consequent upon the cabin lamp falling, and the oil running about, the fire spreading so rapidly that the crew were unable to subdue it. Abandonment justifiable.

1367. *Cygnus*, s.s.; built at Willington Quay, on the Tyne, 1877; owned by Mr. W. E. Kirby and others; tonnage, 1,069; Cardiff to Port Said; coals; supposed to have foundered at sea. Inquiry held at Cardiff, May 25, 1882, before Jones, Judge; Forster and Burney, N.A. No evidence before Court as to cause of loss.

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1368. *Lockyer*, s.s.; built at Sunderland, 1881; owned by Mr. W. Wilkie; tonnage, 1,349; Calcutta to London; wheat and tea; also one passenger; supposed to have foundered at sea. Inquiry held at Newcastle-on-Tyne, before Rothery, Wreck Commissioner; Forster and Castle, N.A. Very deeply laden when leaving Calcutta. Probably foundered in cyclone, which she would seem to have encountered some few days after leaving port.

1369. *Ella Constance*, s.s.; built at South Stockton, 1858; owned by Mr. J. T. Freear; tonnage, 420; Liverpool to Copenhagen; general cargo; stranded on a shoal in Loch Dunvegan, and subsequently in Loch Bay, April 15, 1882. Inquiry held at Newcastle-on-Tyne, May 23, 1882, before Rothery, Wreck Commissioner; Wilson and Parish, N.A. Stranding due to error of judgment on master's part. Certificate not dealt with.

1370. *Hawkhope*, barque; built at South Shields, 1870; owned by Mr. G. E. Henderson; tonnage, 337; Oruba to Hull; phosphate rock; lost on Folle Reef, Ile à Vache, Hayti, when loss of life ensued, January 20, 1882. Inquiry held at Newcastle-on-Tyne, May 24, 1882, before Rothery, Wreck Commissioner; Davies and Murdoch, N.A. Loss caused by master steering a course too close into the land, and for remaining below when approaching the land. Certificate suspended for three months.

1371. *Alfgar*, s.s., and *White Sea*, s.s.; the former built at Stockton, 1873; owned by Mrs. E. Smith and others; tonnage, 637; Hull to Cronstadt; coal and iron; the latter built at Dundee, 1881; owned by R. Guild and W. Lowson; tonnage, 725; Dundee to Hull; general cargo. In collision in Hull Roads, May 4, 1882, when the *Alfgar* foundered, and loss of life ensued. Inquiry held at Hull, May 30, 1882, before Twiss, Judge; Ward, French and Moresby, N.A. Collision due to *White Sea* having improperly starboarded her helm when close to the *Alfgar*. Master of *White Sea* in default. Certificate suspended for three months.

1374. *Boyne*, ship; built at Southampton, 1876; owned by Mr. J. Nourse; tonnage, 1,350; Liverpool to Barbadoes; general cargo; abandoned at sea, April 24, 1882. Inquiry held at Liverpool, May 31, 1882, before Raffles, Judge; Hight, Knox and

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Harland, N.A. Abandonment justifiable, the vessel having been dismasted and on her beam ends.

1375. *W. R. Rickett*, s.s.; built at Pallion, 1871; owned by Mr. J. G. Marychurch; tonnage, 543; Cardiff to Gibraltar; coals; lost on a sand bank near Mondego Light, coast of Portugal, April 26, 1882. Inquiry held at Cardiff, May 31, 1882, before Jones, Judge; Grant, Beasley, and Comyn, N.A. Master and mate in default for steering too southerly a course, and for making no allowance for heave of the sea, &c. In consideration of hardships undergone, reprimanded only.

1378. *Griffin*, s.s.; built at Whiteinch, 1865; owned by Mr. J. Baird; tonnage, 149; Southampton to Mediterranean; passengers; stranded off Cape Bianco, Corfu, March 27, 1882. Inquiry held at Liverpool, June 3, 1882, before Raffles, Judge; Parfitt and Methven, N.A. Master guilty of careless navigation. Certificate suspended for six months.

1379. *Bertha*, s.s.; built at Glasgow, 1864; owned by Mr. H. L. Seligmann; tonnage, 251; stranded on Blackhead, Cornwall, May 11, 1882. Inquiry held at Falmouth, June 3, 1882, before Downing and Webber, Justices; Kennedy and Hyde, N.A. Accident caused by master miscalculating his distance from the Eddystone, and from neglect to use the lead; severely reprimanded.

1384. *Falcon*, s.s., and *Pearl*, dandy; the former built at Dumbarton, 1854; owned by Thomas Wilson and Company; tonnage, 270; Hull to Dunkirk; general cargo; the latter built at Manningtree, 1854; owned by Mr. R. Suggitt; tonnage, 76; engaged on a fishing voyage. In collision off the Bull lightship, River Humber, May 6, 1882, when loss of life ensued. Inquiry held at Hull, June 3, 1882, before Twiss, Judge; Moresby, Vaux, and Parish, N.A. Master of *Falcon* in default for keeping an insufficient look-out and proceeding at too great a speed when in the vicinity of vessels at anchor; but taking into consideration his high character, the Court only reprimanded him severely.

1387. *Mary Agnes*, barge, and *Mona*, s.s.; the former built at Brentford, 1881; owned by Mr. J. J. Dunn; tonnage, 43; proceeding down the Thames; the latter built at Hull, 1866;

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owned by Mr. W. Bailey; tonnage, 425; also proceeding down the river; in collision in Greenwich Reach, May 8, 1882. Inquiry held at Westminster, June 6, 1882, before Rothery, Wreck Commissioner; Burney, Beasley, and Rees, N.A. Master of *Mona* to blame for endeavouring to pass the barge while standing across the river. Court being of opinion that the mistake arose from an error of judgment only, did not deal with his certificate.

1388. *Guide*, schooner, and *Mariner*, s.s.; the former built at Ramsey, Isle of Man, 1862; owned by Mr. R. Pritchard; tonnage, 66; engaged as a pilot boat; the latter built at Stockton, 1881; owned by Messrs T. Harrison; tonnage, 917; Liverpool to Vera Cruz; general cargo; in collision near Bar Ship, Liverpool Bay, February 25, 1882, when loss of life ensued. Inquiry held at Liverpool, June 12, 1882, before Raffles, Stipendiary Magistrate, Grant, Ward, and Wilson, N.A. Accident caused by an improper look-out being kept on board the *Mariner*, for which the second mate of that vessel was responsible. Certificate suspended for three months.

Official Inquiries Abroad, 1882.

1358. *Dexterous*, barque; lost at Pooree, February 15, 1882. Inquiry held at Calcutta, March 16, 1882. Master in default for neglecting to put the ship about in time. Certificate suspended for three months.

1359. *Kameruka*, s.s., and *Esther Maria*, ketch; in collision near Beechcroft Point, February 26, 1882. Inquiry held at Sydney, March 12, 1882. Collision caused by the ketch carrying no lights. Master's certificate suspended for three months.

1362. *Rob Roy*, s.s.; stranded in Cossack Creek, February 20, 1882. Inquiry held at Cossack, W.A., February 27, 1882. Master free from blame. Accident due to the vessel possessing insufficient ground tackle.

1363. *Benalder*, s.s.; stranded on South Laconia Reef, March 13, 1882. Inquiry held at Singapore, March 30, 1882. Master died soon after accident. Officers free from blame.

1366. *Iperia*, brig, and *Tair-el-Bahar*, schooner; in collision

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at sea, April 17, 1881. Inquiry held at Malta, March 13, 1882. Master of schooner to blame.

1372. *Lee*, ship; lost on the Aves Rocks, March 29, 1882. Naval Court held at St. Thomas, W.I., April 25, 1882. Master and officers free from blame.

1373. *Shanghai*, s.s.; in collision with a native passenger boat near Yang-lo, February 15, 1882. Naval Court held at Hankow, March 3, 1882. Collision accidental. No blame attached to officers of *Shanghai*.

1376. *Romeo*, barque; lost between Cape Everard and Ram Head, February 14, 1882. Inquiry held at Sydney, March 1, 1882. Master to blame for carelessly navigating his vessel. Certificate suspended for six months.

1377. *Griffin*, schooner; stranded on the Rangitoto Reef, February 21, 1882. Inquiry held Auckland, N.Z., March 22, 1882. Accident caused by vessel being left by master in charge of only one man on deck.

1380. *Pliny*, s.s.; lost near Long Branch, New Jersey, May 13, 1882. Inquiry held at New York, May 20, 1832. Master in default for not keeping clear of the coast. Certificate suspended for six months.

1381. *Prima Donna*, schooner; lost off Bondi, March 29, 1882. Inquiry held at Sydney, April 12, 1882. Capsized in a heavy squall. Master free from blame.

1382. *Wonga Wonga*, schooner; lost at Terrigal, March 15, 1882. Inquiry held at Sydney, April 3, 1882. Accident caused by vessel missing stays and drifting on the breakers.

1383. *White Cloud*, ketch; stranded at Cape Hawk River, March 16, 1882. Inquiry held at Sydney, April 15, 1882. Master free from blame.

1385. *L. E. Cann*, barque; abandoned at sea, April 27, 1882. Naval Court held at Philadelphia, May 9, 1882. Master censured severely for negligence and displayed apathy.

1386. *Sophia Cook*, brigantine; abandoned at sea, April 12, 1882. Naval Court held at Valparaiso, April 25, 1882. Abandonment justifiable.

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THE

NAUTICAL MAGAZINE

FIFTY-FIRST YEAR.

VOLUME LI.—No. VIII.

AUGUST, 1882.

POLAR RESEARCH.

IN our volume for 1879 we discussed certain Arctic enterprises relating to commercial routes through the Kara Sea to the great Siberian rivers, and to Nordenskiöld's voyage in the *Vega* from the Atlantic to the Pacific by way of the North-East Passage. A brief sketch of what has been done since, also what it is proposed to do to develope our knowledge of the Polar regions, and the correlation of that information with observations made in the temperate zones, will probably be acceptable to our readers.

When the *Vega* had been beset by ice in September, 1878, and Nordenskiöld found himself forced to winter off the Siberian coast, having nearly accomplished the North-East Passage in the one season, he had no means of immediately communicating intelligence as to his position and the safety of the vessel. The news travelled slowly; and meanwhile many thoughtful minds recurred to the numerous earlier expeditions from different countries which had started on the same errand, and which had always ended in failure, often with the loss of ships and crews. Mr. Gordon Bennett immediately equipped a relieving vessel—the *Jeannette*, which had formerly been the *Pandora*, and under the latter name,

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had made two voyages up Baffin Bay. When the *Jeannette* started from San Francisco in July, 1879, the *Vega* had already been released from ice-imprisonment, and had passed through Behring Strait on her homeward voyage. The *Jeannette* being abundantly supplied for an Arctic cruise, and well officered and manned, passed through the Strait to make the passage the reverse way, and she was last seen on the 3rd of September, 1879, steaming in the direction of Wrangel Land. No definite tidings of her having reached Europe or the United States in the season of 1880, the U.S. revenue steamer *Corwin* was despatched to the Behring Sea and neighbouring Arctic Ocean; the coast was examined east and west of the strait; but Wrangel Land being inaccessible, owing to ice, the *Corwin* returned.

When the second winter had passed without intelligence of the *Jeannette*, and some whalers were also reported as missing, a more effectual search was determined upon for the season of 1881, and the U.S. steamers *Corwin* and *Rodgers* were despatched to examine the vicinity of Herald Island and Wrangel Land, and the seas around them.

Wrangel Land had long been an uncertainty and mystery until Captain Kellett got sight of it in 1849, when he discovered and landed on Herald Island, which is in its vicinity. Lieutenant R. M. Berry, U.S. Navy, in command of the *Rodgers*, effected a landing on Herald Island in August, 1881, examined its western extremity, and scanned the remainder from the summit of the highest land with glasses. In September a party was again landed and the examination completed, but no discoveries were made; it lies about 27 to 30 miles due east of Wrangel Land, which Lieutenant Berry completely explored, and determined to be an island.

Wrangel Island is about 70 miles long, east and west, and 35 miles wide, including the sandspits that make out from the north and south coasts from 6 to 10 miles. A range of high hills extends completely around the island near the coast-line, and a lower range extends east and west across the centre. One peak near the centre of the island (Berry Peak) was found by barometric measurement to be 2,500 feet high. The whole island is a succession of peaks and valleys. Several streams were found; the

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largest, rising in the hills near Berry Peak, flows in an easterly (*magnetic*) direction, and empties into the sea. Seven or eight miles westward of Cape Hawaii (the south-easternmost point of the island) one good small harbour was found, where the U.S. steamer *Rodgers* was anchored during her stay of nineteen days. A few bears were seen near the coast. This small but excellent harbour (Rodgers Harbour), of moderate depth of water, is formed by a bight in the coast-line just east of a projecting promontory. Protected on the south by a low neck of sand and pebbles, it is a little more than 200 yards in extent either way, with a depth of from 3 to 3½ fathoms in the centre. Three fathoms can be carried close to the shore on the south side, and 2 to 2½ fathoms close to the bluff on the north shore. There are no hidden dangers. The observation spot, near the western extremity of the low sandy neck, is in lat. 70° 57′ N., long. 178° 10′ W. *Variation* of the compass, 20° E. Rise and fall of tide 5 feet; flood setting to southward and westward.

The *Rodgers* left Wrangel Island on September 13, and, after making an ineffectual attempt to land on Herald Island, steamed to the northward until stopped, September 17, by an impenetrable pack in latitude 73° 9′ N., longitude 174° W., when, it being dark, and having made only 15 miles after working all day, the ship was made fast to a floe for the night. New ice formed during the night, cementing the floes together, and when, at 3 A.M. on the morning of the 18th, an attempt was made to reach a lead about 100 yards distant, it required an hour and fifteen minutes steaming at full speed to accomplish it, after which the pack was skirted to the north-eastward until, having reached latitude 73° 44′ N., longitude 171° 48′ W., it was found impossible to proceed any farther in that direction. From this position no indications of land could be seen from the crow's nest, but, on the contrary, the soundings invariably deepened as the vessel proceeded north. It was therefore thought best, as the main pack trended well to the southward of east from this point, to return to the north-east point of Wrangel Island and proceed thence in a north-westerly direction in search of the high land reported by Captain Smith, of the whaling bark *New Bedford*, as "situated in longitude 178° W.

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and extending as far north of the 73rd parallel as the eye could reach."

Leaving Wrangel Island a second time, on September 22nd, the 178th meridian was crossed, and a position in latitude 73° 28′ N., longitude 179° 52′ E., was reached, where the solid pack was again encountered; thence steering to the south-eastward, along the edge of the pack, the 178th meridan was recrossed in latitude 73° N. without sighting land, the horizon throughout and the sky to the northward being clear. As before, it was found that the depth of water gradually increased northward of Wrangel Island, but the depths were less than to the north-eastward, the greatest depth (82 fathoms) having been found at the most north-easterly point reached, viz., latitude 73° 44′ N., longitude 171° 48′ W. Thus was dissipated the myth of the "Belvin Mountains" and high peaks stretching far to the northward.

Except in a few instances, where a lead was followed for a short distance, the ice was of such a nature as to make it impossible to pass its outer edge, consisting in some places of heavy pack and in others of unbroken fields miles in extent. The field-ice was from two to three feet out of water.

This is the most important geographical exploration that has been made in this part of the Arctic Ocean for many years.

The *Rodgers*, which was wintering in St. Lawrence Bay, the last harbour on the Asiatic side of Behring Strait before entering the Arctic Ocean, was destroyed by fire on January 1, 1882.

The fate of the *Jeannette* is also now known. She was caught in the ice at an early period after entering the Polar waters, drifted about with it for many months, and was finally crushed. The officers and crew were then compelled to abandon her, and take to the boats. Several of the party, in a deplorable condition, succeeded in reaching the mouth of the Lena, where they were hospitably received and well cared for; but the commander (Lieut. de Long) and his companions, when sought for and found, were all dead. Many of the books and papers have also been found. The third boat is still missing. The record of the work done, and observations made, will most probably be of some value.

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Turning towards Greenland and Baffin Bay no Arctic exploration has been undertaken along that route since the expedition of the *Alert* and *Discovery*, with Captain (now Sir) George Nares in command, in 1875-6. Passing northward into Smith Sound, through Kennedy Channel, and thence into Robeson Channel, the *Alert* sheltered inside the stranded floes on the west side of Robeson Channel in lat. 82° 27′ N., the most northerly point yet attained by a ship in that part of the Polar Sea. Sledging parties explored northward, eastward, and westward, and the party under the charge of Commander Markham reached lat. 83° 20½′ N., and within 400 miles of the North Pole. The Polar waters to the northward have been named the Palæocrystic Sea, the ice in it being from 80 to 100 feet thick, or more. "Careful and diligent observation furnish some data by which a judgment might be formed of the probable extent of the Palæocrystic Sea. It is certain that land was not near to the north, because hills were ascended to a height of 1,500 feet and upwards on clear days, and there was not a sign of land. But there are other considerations all tending to the same conclusion. There are no flights of birds to the north, which certainly would be the case if there was land; and the only living thing that was seen on the Palæocrystic Sea by the northern division of sledges was a little snow bunting that had strayed from the nearest shore. Further evidence is furnished by the fact that marine animal life almost ceases to exist in the ice-covered Polar Sea. The Palæocrystic Sea is a sea of solitude."

It is probable that the North Pole will never again be sought in the direction of Smith Sound.

The circumnavigation of Novaia Zemblia in 1870 and 1871 (and the discovery of the hut in which Barents, the old Arctic voyager of 1596-7, had wintered), the voyage of the yacht *Isbjörn* when Weyprecht and Payer penetrated by the way of the Barents Sea into lat. 78° 38′ N., the subsequent discovery by the same explorers of Franz Josef Land in lat. 80° N., the successful issue of a few commercial voyages through the Kara Sea and thence to the Siberian rivers Obi and Yenesei, and Nordenskiöld's splendid achievement of the North-East Passage, have given a stimulus to Polar exploration in a

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direction which had long been neglected; that is, northward and in the direction between Spitzbergen and Novaia Zemblia. Nor have these ventures been more than partially under governmental control, with the exception of the cruise of the U.S.S. *Alliance* in the Barents Sea in 1881; indeed the majority have been wholly private yachting cruises. The *Willem Barents* visited the north-eastern seas in 1878-79-80 and 81; the object of her voyages being a systematic investigation of the Barents Sea during a course of years, so as to be in a position, after mature consideration of all the probabilities, to select a new base for future Polar exploration. There have been the voyages of the cutter yacht *Isbjörn*, with Sir Henry Gore Booth and Captain A. H. Markham, in one of which Franz Josef Land was reached within 80 miles. In the yachting cruise of 1880, Mr. Leigh Smith, in his steam yacht *Eira*, was enabled to explore the south-western coasts of Franz Josef Land. He returned in safety. But in the expedition of 1881, when he would endeavour, if the ice was sufficiently open, to again reach the coast of Franz Josef Land, and pursue his discoveries of 1880, it is supposed that he must either have got so beset in the pack as to be unable to extricate his ship, or having reached the coast of Franz Josef Land he has been frozen up in some bay or harbour. A relief expedition, the *Hope*, under the command of Sir Allen Young, has already started in search of the *Eira*. The *Willem Barents* in her cruise of 1882, Sir Henry Gore Booth in the Arctic yacht *Kara*, the Arctic exploring ship *Dijmphna* in command of Lieut. Hovgaard, the ice-traders and walrus hunters will all be on the look-out for the missing vessel; supplies are to be deposited at various spots in the Arctic Sea, so as to be ready if required, and large rewards await the fishers and hunters that shall first give information in respect to the position of the *Eira*. News of the missing vessel is now anxiously expected, more especially as we know that there have been important changes in the disposition of ice in the Atlantic and in the Barents Sea during the past two years, and the seasons have been more than usually unpropitious for Arctic voyaging.

As we said when discussing the commercial voyages to Siberia, it is evident that, though the North Pole, if it be ever reached, must be

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sought in a direction through the Barents Sea, there are good seasons and bad; the former apparently and happily predominate; even the Kara Sea cannot be traversed every year; and it is only by means of observations at selected spots within the Arctic circle that we shall eventually obtain a good knowledge of Arctic phenomena.

Arctic voyages are no longer what they were. After extraordinary efforts had been made, and fearful dangers (often ending in complete disaster) had been encountered with the expectation of finding a passage to the "far Cathay" either by the north-east, or the north-west, it gradually came to be a recognised fact that, though such a passage might be discovered, the proper and only sure route to the East lay round the Cape of Good Hope. Thenceforth Arctic voyages—undertaken only at fitful intervals—combined the twofold objects of geographical research and scientific investigation, with ever the hope of some enterprising navigator reaching the Pole. The spirit in which voyages to the Polar seas are now undertaken is well exemplified in the instructions to the Antarctic expedition of 1839.

When the Royal Society had recommended to the Government of the day the equipment of an Antarctic expedition for scientific objects, and were informed by the Admiralty that it had been determined to send out Captain James Clark Ross on such an expedition, the Council of the Society were at the same time requested to furnish any suggestions to which they might wish Captain Ross' attention to be especially directed. Having due regard to the magnitude and importance of the question submitted to them, the Council, through several distinct committees composed of members of the Society who were especially conversant with particular branches of science, drew up some valuable reports on physics and meteorology, on geology and mineralogy, on botany and vegetable physiology, and on zoology and animal physiology.

On sound scientific grounds all these subjects are equally deserving of attentive inquiry; but in relation to navigation the department of physics and meteorology stands first, and the number and importance of the various *desiderata* were discussed

under the several headings of terrestrial magnetism, the figure of the earth, tides, meteorology, distribution of temperature in the sea and land, currents of the ocean, depth of the sea, variable stars, refraction and eclipses. This report also embraced valuable instructions and suggestions for making meteorological observations, classified under the sub-heads of barometers—thermometers—actinometers — radiating thermometers — hygrometers — vanes, anemometers and rain-gauges—clouds and meteors—electrometers —and the most approved form and times of registry.

The expedition, consisting of the ships *Erebus* and *Terror* under the command of Captain J. C. Ross started in 1839, to determine the position of the South Magnetic Pole and to explore the Antarctic Seas in the highest possible latitudes; the ships returned in 1843, and though the magnetic pole of the southern hemisphere was not reached, it is now matter of history that the instructions were fully carried out, and a rich fund of observations was obtained; the work was done, and done well, as indeed it may be said has been the case with all our Polar expeditions.

But if much has been done in the past, much more remains to be determined in the future, and our knowledge in certain departments would always remain imperfect if synchronous observations in high, middle and low latitudes were impossible. Happily this is not the case, and the investigation of the meteorological and magnetical, and generally the physical, conditions of the Polar regions, and the immediately contiguous zones of the earth, is about to be commenced according to a uniform plan, and at the same instant of absolute time. The justification of the importance of the undertaking has been well put in a late "Report of the International Meteorological Committee."

(1.) From a *meteorological point* of view it is impossible, without an exact knowledge of the occurrences and phenomena which take place in the Polar regions, to establish general principles and theories relating to the pressure of the air, the distribution and variations of temperature and air currents, the development and change of weather, or general climatological laws. For the northern hemisphere, and especially for the meteorological

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phenomena in North America, Northern Europe, and Northern Asia, this fact is sufficiently demonstrated by a study of synoptic charts, and of the results of simultaneous observations hitherto carried on within a limited area. Especially important is the extension of the domain of simultaneous meteorological work towards the Arctic regions for the development of the prognostication of weather and storms for the whole of Europe and North America. Owing to the close connection of the Antarctic regions (undisturbed by continental influence) with the contiguous districts of latitudes within which traffic by sea is carried on, the establishment of general laws, on the one hand, can be essentially promoted, in consequence of the homogeneity of the earth's surface, whilst, on the other hand, the extension of meteorological investigation towards the south, for the further development of science, cannot be dispensed with.

(2.) From the standpoint of the science of *terrestrial magnetism* absolute synchronous readings from time to time of all the three elements are required, with a view to the exact determination of the relation between the simultaneous variations of horizontal and vertical force. Simultaneous observations for the development of the theory of the disturbances in the magnetic elements, whose relations to aurora and sun spots is a condition without the fulfilment of which no decided advance in our knowledge can be hoped for. Also, observations of earth currents in close connection with the magnetic observations and the phenomena of aurora. For the knowledge of the distribution of the magnetic force of the earth, and its secular and other changes over the earth, a thorough investigation at a definite epoch of the present time is indispensable.

(3.) In relation to the *hydrography of the oceans*, the theory of the distribution of heat and currents is wanting in those fundamental factors by the help of which alone a scientific foundation, sufficing for all requirements, can be obtained, so long as a thorough examination of the Polar regions, by means of accurate instruments, does not exist. Observations of currents, both as to direction and force; and also the motion of ice. Deep sea soundings, and observations on the physical properties of sea

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water, for example, the determination of temperature, specific gravity, gaseous contents, &c.

(4.) The knowledge of the figure of the earth is incomplete, and rests partly upon hypothesis, so long as no certain measurements exist, according to the most recent methods, in the Polar regions, and especially in the northern hemisphere.

(5.) Astronomical observations relating to atmospheric refraction, the radiant points of meteors, &c., are wanting.

All the International circumpolar observatory parties have now started for their respective destinations, and on August 1, 1882, observations will be commenced simultaneously on the basis arranged at the different conferences held at Hamburg in 1879, at Berne in 1880, and at St. Petersburg in 1881. Russia has undertaken three stations, the United States and Germany two each, whilst Austria, Denmark, England, Finland, France, Holland, Italy, Norway and Sweden take one each. The total number of stations is thus fifteen, with a complement of about 150 persons. Three of the stations are on the borders of the Antarctic ocean, and are occupied respectively by France, Italy, and Germany; the rest are Arctic. The work will be carried on continuously for thirteen months, from August 1, 1882, to August 31, 1883. The northern shores of Siberia, and the islands Jan Mayen and Spitzbergen will be occupied. The northernmost United States station is Discovery Harbour, Lady Franklin Bay, in lat. 81° 40′ N.: the French take Cape Horn, and the Germans one of the islands of South Georgia in lat. 54° 30′ S. The British station is Fort Rae in Canada, and as our readers know (see *Nautical Magazine*, p. 365), the Meteorological Office has requested owners, captains, and officers of steamers and sailing vessels traversing the North Atlantic to assist in the work, so that the weather of the North Atlantic may be charted and discussed with the land observations. General W. B. Hazen, Chief Signal Officer of the United States, in reference to International Polar research, remarks that it has become clear that, owing to the very mobile nature of the atmosphere, the changes taking place in one portion of the globe—especially the Arctic Zone—quickly affect very distant regions. The study of the weather cannot be properly carried out without

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a daily map of the whole northern hemisphere, and the great blank space of the Arctic region has long been a source of regret. From simultaneous observations made at numerous points in every zone, we may expect such additions to our knowledge as could not be acquired by isolated or desultory travelling parties.

ABSTRACTS OF SEA CASUALTIES, 1880-1.

THE Wreck Abstracts which have just been published by the Board of Trade contain elaborate details of all the wrecks and casualties which occurred on the coasts of the United Kingdom during the twelve months ended June, 1881, or were reported as having occurred to British vessels abroad and to foreign vessels on the coasts of British possessions abroad during the same period. The totals of losses and casualties in each of the four preceding years are also given in each table, and the reader is thus enabled to compare the losses in five consecutive years.

The result is not satisfactory. We discover that the great diminution in the loss of life and property at sea which marked the years 1877-8, 1878-9 and 1879-80 was probably owing rather to the absence of destructive gales and the existence of other favourable natural conditions than to the effect of legislation and surveys. Doubtless the greater care which has been taken to detect unseaworthiness in ships and to prevent overloading and improper loading has not been altogether fruitless, but it is disappointing to find that any success which may have been achieved in this direction is not distinctly obvious in the gross results, and that the temporary diminution in losses was not owing, as asserted by some, to the legislation partly brought about by the Parliamentary frenzy and political effacement of Mr. Plimsoll.

The following table compares the losses of British vessels which

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occurred or were reported during the year 1880-1, with the corresponding losses in the preceding year.

BRITISH VESSELS LOST IN 1880-1.

	Sailing.		Steam.		Total.	
	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
Belonging to the United Kingdom	838	204,236	118	78,443	956	282,679
Belonging to British Possessions	343	62,815	11	2,692	354	65,507
	1,181	267,051	129	81,135	1,310	348,186

BRITISH VESSELS LOST IN 1879-80.

	Sailing.		Steam.		Total.	
	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
Belonging to the United Kingdom	507	151,351	102	77,662	609	229,013
Belonging to British Possessions	356	68,690	7	1,272	363	62,962
	863	220,041	109	78,934	972	291,975

The foregoing figures show that the entire increase in the losses during 1880-1 as compared with the previous year, occurred in vessels registered in the United Kingdom. They also show that the principal increase occurred in the losses of *sailing* vessels belonging to the United Kingdom, and these facts lead to the inference that the gales of 26th to 29th October, 1880, and the 18th of January and 5th of March, 1881, which blew so hard upon the eastern coasts, were reponsible for the exceptionally formidable list of losses in the year under consideration. Our readers will remember the terrible violence of those storms, and will recognise in the foregoing figures the tabulated results of the reports which appeared at the time in the daily papers relating to the scores of wrecks which fringed the east coast. A reference to tables 6 and 7 and 11 in the return will show (1) that 237 vessels were wrecked between Fern Islands and North Foreland compared with 62 in the same district in the preceding year; (2) that 165 vessels in ballast and 125 coal-laden vessels were lost on our coasts in 1880-1 against 43 and 81 of the same classes respectively in the preceding year; and (3) that of the 344 vessels lost by stress of weather on our coasts, no less than 210 were lost whilst the wind was between N.E. and S.E. It is therefore apparent that the collier class of vessel must have suffered most

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heavily, and that the chief item of increase in the number of losses during the year was contributed by such vessels going northward in ballast trim, and being caught on a lee shore by the gales before referred to. Whether any of these vessels would have been saved if harbours of refuge had been constructed at Filey and other places on the east coast is a matter which the Commission, which is now sitting to consider the question of the employment of convict labour, will probably investigate. It is however right to point out that the vessels were not of great value and the loss of life scarcely proportionate to the loss of vessels, and that the gales which caused the disasters were of such an exceptional character that few of the vessels lost would have been able to avail themselves of a harbour if it had existed. No less than 50 vessels coasting in the United Kingdom were missing during the year, against 7 and 19 respectively in the two previous years.

But to return to the total number of losses in the year 1880-1; it appears that they bear the following percentages to the number and tonnage of vessels registered in the United Kingdom and Colonies respectively :—

	British Sailing.		British Steam.		Colonial Sailing.		Colonial Steam.	
	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
1880-1 ...	4·5	5·6	2·1	2·6	2·7	3·7	·63	1·1
1879-80 ...	2·6	4·	1·9	2·8	2·8	4·	·42	·5
1878-9 ...	2·7	3·6	1·9	2·5	2·9	4·7	1·2	2·9
1877-8 ...	2·6	3·5	1·8	2·3	2·7	3·8	1·	2·2
1876-7 ...	3·1	3·9	1·9	2·5	3·5	4·3	1·2	1·7

Altogether about 3·38 per cent. of British vessels in existence, and 4·06 of their tonnage were lost during the years 1880-1, against 2·49 of the vessels and 3·5 of the tonnage in 1879-80; 2·6 of the vessels and 3·5 of the tonnage in 1878-9; 2·5 of the vessels and 3·23 of the tonnage in 1877-8; and 3· of the vessels and 3·58 of their tonnage in 1876-7. The few gales referred to above which occurred in our home seas raise the percentage of losses in British vessels throughout the world to a higher point than it had reached in any of the previous years dealt with in the return, and probably contributed a greater number of losses to the general total than had been caused by any gale since that of the 23rd August, 1873, which strewed the American coasts with wrecks.

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In addition to the vessels which were totally lost there were 1,589 vessels of 676,959 tons, including 508 steamers of 353,881 tons seriously damaged, and 3,410 vessels of 1,319,191 tons, including 962 steamers of 710,749 tons slightly damaged. Assuming the value of the steamships lost to have been £15 per ton and of the sailing ships £8, the value of the ships totally lost would be, steamships, £1,217,025; sailing ships, £2,136,408; total, £3,353,433 as compared with an estimated value of £2,844,338 for the ships lost in the previous year. Assuming that the vessels which met with serious and unimportant casualties were damaged or depreciated by 25 per cent., the loss to British shipping by casualties not resulting in the total loss of the vessels would be £5,853,862, which added to the value of the vessels totally lost would raise the loss to British shipping by casualty, collision, or shipwreck to the total of £9,207,295. If the value of the cargoes sacrificed in the vessels totally lost, or damaged in the vessels which met with serious casualties, were added to the above estimate, the amount of the loss sustained by British commerce and shipping by sea casualties would certainly appear enormous.

In the following table the average sizes of the vessels totally lost in 1880-1 are compared with the sizes of the vessels totally lost in the four preceding years. We noted last year that the average and actual tonnage of the vessels lost were higher than the average for the three preceding years, whereas the number of wrecks was lower. In the present return we find that, although the actual tonnage is greater, the average tonnage is less than in the four preceding years. This result is doubtless produced by the numerous losses of small vessels during the gales of October, 1880, before referred to.

BRITISH SHIPS LOST DURING 1880-1, WITH AVERAGE OF LOSSES IN THE FOUR PRECEDING YEARS.

	Year 1879-80.			Average for 1876-7-8-9-80.		
	No.	Actual Tonnage.	Average. Tonnage.	No.	Tonnage.	Average Tonnage.
Founderings ...	216	56,723	262	186	55,948	300
Strandings ...	765	191,044	249	599	153,083	255
Collisions ...	93	27,848	299	84	19,964	237
Other Causes ...	73	34,856	477	58	22,242	383
Missing Vessels	163	37,715	231	104	39,000	375
	1,310	348,186	265	1,031	290,237	281

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Causes of Loss.

Eliminating the vessels totally lost by collision, which are dealt with elsewhere, and the vessels missing, concerning whose loss it is only within the province of the Wreck Commissioner to express an opinion, we find, as might be expected as a result of the gales before referred to, that the majority of the total losses were owing to stress of weather.

	Weather.	Defects in Ships or Stowage.	Bad Navigation or Seamanship.	Various.	Total.
Founderings ...	130	45	10	31	216
Strandings ...	453	21	185	106	765
Other Causes ...	20	8	1	44	73
Totals 1880-81 ...	603	74	196	181	1,054
„ 1879-80 ...	425	68	190	128	811

The number of vessels which stranded owing to stress of weather or other unfavourable meteorological conditions, was 453 in 1880-1 against 297 in 1879-80. The numbers lost from unseaworthiness in the two years were singularly close, as were also the numbers lost by bad navigation and seamanship. When one reflects upon the fleets of barges, fishing craft and other small coasting vessels which are to be found upon home and colonial coasts, one is not surprised that 74 vessels were lost during one bad season from unseaworthiness. The craft which furnish the majority of the vessels in the unseaworthy column are subject to little or no supervision, seldom go out of sight of land and are often commanded and navigated by the owner and some of his relatives who stick by the ship until she goes down, when they quietly row ashore in their boat. They are usually hardy, hard working sailors who very well know the capacities of their vessels, and ordinarily do not stand in much risk of life, but we fear that when sudden storms, such as occurred in the year under consideration, or on the 14th of October last, overtake them they are found sadly deficient.

Amongst the "various" causes of loss we regret to find 5 vessels lost by spontaneous combustion of coal, and 1 by explosion of coal gas. In the Abstract for 1879-80 not one case of spontaneous combustion was recorded, and there appeared to be therefore some ground for hoping that the work of the Royal Commissioners who reported on the subject of spontaneous combustion of coal in ships

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had produced good results. The Wreck Abstract for 1880-1 shows however, that very little, if any, improvement has taken place, and that spontaneous combustion is still an element of danger in coal-laden vessels. Indeed we have reason to believe that the losses caused by spontaneous combustion since the period to which the present Wreck Abstract applies, show a marked increase. Recent reports of inquiry have shown that spontaneous combustion has developed itself in coal shipped at Hull, which had previously been considered free from that dangerous quality. Coal shipped from the Garn Goch Colliery in Wales has alone caused the loss of several vessels by spontaneous combustion during the past few months, and these facts strengthen the conclusion arrived at by the Royal Commissioners, viz., that "certain descriptions of coal are intrinsically dangerous for shipment on long voyages." It appears from some correspondence presented to Parliament that the Commissioners of Customs undertook to keep a record of the description of all coal shipped for export in the United Kingdom, but it does not appear that any use has hitherto been made of this information. We would suggest for the consideration of the Board of Trade whether a return should not be prepared for a certain period giving the names of all vessels loaded with coal for export: together with the description of the coal, and showing the cases in which spontaneous combustion occurred. Such a return would probably lead to the detection and prevent the shipment of coal peculiarly liable to spontaneous combustion. The trouble and cost attending the preparation of the return would surely be amply repaid, if it were to lead as it probably would, to the prevention of one loss out of the many which are known to occur from this cause.

The cargoes of the vessels totally lost are shown in the following table:

	Ballast.	Timber.	Grain.	Coal.	General.	Fishing.	Other Cargoes.	Total.
Founderings	22	28	14	37	9	20	86	216
Strandings	217	73	33	132	72	57	181	765
Other Causes	12	15	3	10	6	7	20	73
Missing Vessels	17	7	18	40	1	29	51	163
Totals 1880-1	268	123	68	219	88	113	338	1,217
„ 1879-80	158	86	79	178	76	56	253	886

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The vessels which were lost by collision are excluded from the foregoing table, because it is presumed that their cargoes could not have contributed to their loss. The general increase in the number of losses is pretty fairly distributed amongst the various descriptions of cargo, with the exception of "grain," in which trade as predicted in our last year's remarks, an actual decrease has occurred. The grain-laden vessels lost in the year 1880-1, were as follows :—

	Sailing.		Steam.		Total	
	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
Foundered ...	9	3,257	5	4,061	14	7,318
Missing	15	3,575	3	3,401	18	6,976
Totals 1880-1 ...	24	6,832	8	7,462	32	14,294
„ 1879-80...	30	20,205	9	10,324	39	30,529

It will be seen from the foregoing table that notwithstanding an increase of 350 in the number of total losses in the year 1880-1 there was a decrease of 7 in the number of grain-laden vessels foundered and missing with a decrease of 16,000 tons, as compared with the similar losses in the year 1879-80. In the year 1880-1 there were 163 vessels missing in all trades against 75 vessels missing in the year 1879-80, but although as shown the missing vessels were doubled in number, only 3 more grain-laden vessels were missing in 1880-1, than in 1879-80. Going further we find that if the missing vessels in the coasting trade and on short voyages be omitted there only remain 9 missing grain-laden vessels in 1880-1, against 15 in 1879-80; of the 9 only 5 belonged to the United Kingdom, and of the 15, eleven belonged to the United Kingdom. One would expect from the strictures of the Wreck Commissioner in the cases of the *Essex* and *Firth of Cromarty*, as to the mode of loading rice in British Burmah, that the losses of rice-laden vessels were numerous, but although agreeing theoretically with his denunciations of certain kinds of ventilation we are unable to find in the present return any reason to interfere with the trade. In 1876 the losses were very serious, but since that year they have been declining in number, and in the present return we are unable to find a single loss of a rice-laden vessel on an oversea voyage, although it is known that there has been an increase in the export of rice from British Burmah. This immunity from loss may be accidental and not lasting, but it appears to us

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that it should evoke congratulation with those chiefly concerned instead of censure, and is sufficiently striking to suggest to the Board of Trade and the India Government the desirability of instituting an exhaustive inquiry into the whole subject before imposing upon the trade any rules founded upon the dogmatic utterances of the Wreck Courts.

Loss of Life in 1880-1.

The great increase in the number of British vessels lost in 1880-1 was naturally attended by an increase in the number of lives lost.

The following table, shows at a glance the number of lives lost by various descriptions of casualties to British vessels in the coasting, oversea and fishing trades of the British Empire.

By turning to our pages for July of the years 1881 and 1879, and June, 1880, our readers will be able to institute a comparison between the losses in the various years.

Lives Lost in British Vessels of all Descriptions at Home and Abroad.

		Coasting.	Oversea.	Fishing.	Total
Founderings	Vessels	17	22	10	49
	Lives Lost	63	133	58	254
Strandings	Vessels	55	65	10	130
	Lives Lost	329	488	19	836
Collisions	Vessels	16	13	10	39
	Lives Lost	49	45	18	112
Other Causes	Vessels	27	61	33	121
	Lives Lost	70	245	56	371
Missing Vessels	Vessels	61	72	29	162
	Lives Lost	303	864	183	1,350
Totals	Vessels	176	233	92	501
	Lives Lost	814	1,775	334	2,923

The loss of life in colonial vessels may be compared with the loss of life in vessels belonging to ports in the United Kingdom as follows :—

		Coasting.	Oversea.	Fishing.	Total.
Belonging to United Kingdom	Vessels	138	176	88	402
	Lives Lost	520	1,490	329	2,339
Colonies	Vessels	38	57	4	99
	Lives Lost	294	285	5	584
Totals	Vessels	176	233	92	501
	Lives Lost	814	1,775	334	2,923

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From the foregoing tables we find that there has been an actual decrease in the number of lives lost in vessels which foundered. This must however be considered an accidental circumstance as there were many more lives risked in the latter than in the former year by vessels foundering.

A great increase appears in the number of lives lost by stranding which is probably owing to the number of vessels cast ashore on the east coast during the October gales. There is an increase in the number of lives lost by "other causes" which is partly owing to the lives lost in H.M.S. *Doterel* (143) being included under that head.

There is no great fluctuation in the lives lost by collision. Under the heading of "missing vessels" we find that the numbers of lives lost in the two years were about equal, although the number of vessels missing in the latter year were double those missing in the former year. This is partly owing to the fact that in 1879-80 the lives lost in H.M.S. *Atalanta* (281) were included in the "missing" column, and partly to the fact that a large number of vessels of small tonnage and few hands were missing in the the great gales of 1880-1.

Lives Lost on the Coasts of the United Kingdom.

The number of lives lost on the coasts of the United Kingdom during 1880-1 was 984, which is 753 in excess of the number lost in the preceding year, and 387 higher than the average for the four preceding years. As before observed the increase was almost entirely due to the gales of 28th and 29th October in which considerably over 300 lives were lost on our coasts.

The following table will show the lives lost on the coasts of the United Kingdom as compared with the losses in the four previous years. It should be understood that the figures in the following table were included in the foregoing general table.

	Sailing.		Steam.		Total.	
	Vessels.	Lives Lost.	Vessels.	Lives Lost.	Vessels.	Lives Lost.
British Vessels	189	722	19	130	203	841
Foreign Vessels	28	129	2	3	30	132
Totals 1880-1 ...	217	851	11	133	338	984
„ 1879-80	66	197	15	34	81	231
„ 1878-9 ...	105	377	13	113	118	490
„ 1877-8 ...	111	802	15	90	126	892
„ 1876-7 ...	117	680	15	96	192	776

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Of the 984 lives lost on our coasts 481 were lost in 98 vessels which stranded; 96 from 32 vessels in collisions; 104 from 41 vessels which met with various casualties; 66 in 17 vessels which foundered; and 237 in 50 missing vessels which were bound from one port to another in the United Kingdom.

Lives Lost Abroad.

The number of lives lost in British vessels abroad was 2,071 (including 143 from H.M.S. *Doterel*), against 1,972 in the year 1879-80 (including 281 in H.M.S. *Atalanta*). It will thus be seen that the whole of the increase in the number of lives lost was made up by the losses on home coasts added to the increase in the number of lives lost abroad in H.M. ships. Of the 2,071 lives lost abroad 379 were lost on the coasts of British Possessions, 360 on the coasts of foreign countries, and 1,332 were lost at sea. Again of these 2,071 lives which were lost abroad, 192 were lost in vessels which foundered, 460 in vessels which stranded, 39 from vessels in collision, 267 (including 143 from H.M.S. *Doterel*) from vessels which met with other casualties, and 1,113 in 112 vessels which were missing.

In all the sad circumstances attending disaster at sea there is nothing so melancholy as the fate of these missing vessels. When there are survivors from a wreck or a collision, like the *Eurydice* or *Douro*, there are letters to the papers giving harrowing details of the calamity which excite the sympathy of the whole nation; but when a vessel is "missing" there are re-insurances at Lloyd's followed by the issue of a yellow slip stating that she has been "posted," and there the matter ends. Shipowners receive their insurance and send forth new vessels, but the sons, and husbands, and fathers, never return to the mothers, and wives, and children, who hope, and despair, and want. Notwithstanding surveys, and inquiries, and Acts of Parliament, the number of lives lost in missing vessels is still truly lamentable. When a disaster occurs in a coal mine, or a great loss occurs under the eyes of the nation, like the *Princess Alice* collision, subscriptions are set on foot and liberally responded to; but when vessels and their crews are missing, little or no notice is taken, and the families of the

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masters, officers, and seamen, are left too often to the tender mercies of the parish. Can nothing be done by way of a fund, national or otherwise, to help these unfortunates? It is probable that there were never before so many coasting traders "missing" in one year; but we have reason to believe that the records of the year (1880-1) under consideration will be far surpassed as regards loss of life in "missing" vessels by the records of the twelve months (1881-2) which ended on June 30 last. The report of shipwreck and loss of life which were known to have been caused by the hurricane which occurred on October 14, 1881, were published at the time; but there are few who know of the list of vessels which are "supposed to have been lost in that gale." The next abstract will show them, and perhaps a future philanthropist will use the figures to show that the Board of Trade is in league with shipowners to drown sailors, and yet there were more inquiries held into the loss of missing vessels, and more official surveys held in the year under notice than in any previous year.

Lives Saved from Shipwreck.

We have seen how terrible the records of life lost on our coasts during the past year have been, but it is not possible to realize what they might have been without turning to the table showing the means by which lives were saved.

It appears that 5,071 lives were saved from shipwreck on the coasts of the United Kingdom, and 6,632 at sea and abroad, making a total of 11,703 lives saved during the twelve months.

Of the 5,071 lives saved at home, 809 were saved by assistance from the shore, of which 657 were saved by means of the rocket apparatus, and 152 were saved by the rocket parties and others by means other than the apparatus. The rocket apparatus was more successful in saving life in the year 1880-1 than in any other year since its institution, except 1876-7, when eight more lives were saved, but in that year the number was greatly swelled by the rescue of several hundred passengers from the s.s. *Dacota*. As regards the number, bravery and success of the services rendered by the rocket apparatus the records of the year 1880-1 have never been surpassed, and it is worthy of note that the

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lives saved by the apparatus were also considerably higher in number than the lives saved by the friendly rivalry of the boats of the Royal National Lifeboat Institution. As previously remarked in our columns the rocket apparatus is usually available only in cases of extreme jeopardy, and the very extreme violence of the gales of 1880-1 which drove so many vessels to destruction, afforded the apparatus an opportunity of saving many lives from certain death, whereas the same cause prevented the lifeboats in many cases from rendering assistance. The number of lives saved by lifeboats was 633, by Coastguard and other boats 386, by passing vessels 1,028, and by ships own boats 2,006. It is singular that only eight lives were saved on our coasts from wreck by lifebuoys and appliances kept on board, and only eleven abroad. Of the 6,632 lives saved at sea and abroad, 234 were saved by rocket apparatus, and only 84 by lifeboats, but of course the greater number were saved in their own boats and the boats of passing ships.

CASE OF THE "CITY OF LIMERICK."

[In regard to this most important case we think our subscribers will be glad to have the judgment *in extenso* for purposes of reference.—Ed. *N. M.*]

Thompson v. Farrer.

(Before Lord Justice Brett and Lord Justice Cotton.)

JUDGMENT OF THE COURT OF APPEAL.

LORD JUSTICE BRETT:—"In this case the plaintiff was the owner of an iron steamship the *City of Limerick*. In the autumn of 1880, the ship was at Sunderland, preparing to proceed with an ordinary cargo to America, and to return with a cargo partly consisting of cattle. Whilst the ship was thus preparing to carry out such purposes the officials at Sunderland of the Board of Trade communicated with the Board in London. In the result, the ship was

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provisionally detained under the Merchant Shipping Act Amendment Act, 1876, by an Order of the Board of Trade. Afterwards, under the same statute, a Court of Survey was held before Mr. Rothery and others who held and reported as follows:—'The conclusion then to which we have come is that whether we look to the outward or the homeward voyage, this vessel is not unfit to proceed to sea without serious damage to human life, having regard to the nature of the service for which she is intended, and that consequently the Board of Trade officers had no right to detain her. Under the circumstances we have no option but to order the vessel to be released forthwith.' The vessel was accordingly released. The present action was then brought by the plaintiffs in order to recover compensation for the loss to them by reason of the provisional detention. The case was tried before the Lord Chief Justice and a special jury at Liverpool. The jury found for the plaintiff. A motion was made in a Divisional Court for a new trial for misdirection, and as for a verdict against the weight of the evidence. Mr. Justice Field and Mr. Justice North refused to grant a rule. A rule *nisi* was afterwards granted in this Court, and upon showing cause the case was exhaustively argued before my Brother Cotton and myself.

"At the trial before Lord Coleridge it was admitted for the purpose of that trial, that the ship was in fact a safe ship for the proposed voyages both out and home.

"The following facts amongst others were given in evidence, first, as to the construction and former use of the ship, evidence in accordance with the statement of facts contained in the judgment or report of Mr. Rothery; then certain letters from officers of the Board of Trade at Sunderland to officers of the Board in London to the following effect:—On the 21st April, 1881, Mr. Mills, a surveyor of the Board stationed at Sunderland, wrote to the Assistant-Secretary in London: '*City of Limerick.*—An application has been made for a passenger certificate. She has been until recently a vessel with two decks and a spar-deck. Her present owners have now fitted her with an additional awning deck about four-fifths of length. The ship presents a curious and abnormal appearance, and a question arises in the minds of the

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surveyor and with myself, how far such a superstructure on a vessel of already great depth and small breadth detracts from her sea-worthiness. I therefore beg to submit that it is a case wherein the opinion of the consultative staff should be taken. The case is urgent, as the vessel is soon to leave Sunderland for America.' A minute was made on this report by Captain Sir Digby Murray, an officer of the Board: 'I should advise that we absolutely decline to grant this vessel a passenger certificate. There still remains the question whether we are to permit her to proceed to sea or whether we ought not to detain her as unsafe. We should send Mr. Wimshurst to survey, &c.' On the 28th of April, Messrs. Mills and Wimshurst made a joint report: 'We have now inspected this vessel, &c. Above the spar-deck is now being added the frames, beams, planks, &c., for a further deck-covering or platform, extending about four-fifths of the vessel's length for the conveyance of cattle, &c. The following considerations arise, &c. As to whether from the great depth to breadth and the danger of the top structure getting partly filled with water the ship is in such condition as that she may be allowed to sail on a sea voyage. We think it is possible with special loading and provisions that she may be made safe to leave the United Kingdom, but she will without doubt be dangerous when loaded in a usual method, or with cattle upon the upper deck. We therefore suggest the desirability of the Board leaving the responsibility of such an altogether exceptional case upon a Court of Survey.' Upon this the following minutes were made in London: 'Our duty is clear. Instruct Mr. Mills that we have received his joint report, and we understand that he will detain this ship if she attempts to proceed to sea. That being so, he should take care that the steps he takes are effectual;' and by the President of the Board: 'I approve of what has been done. The owner may be told that the Board of Trade will not take the responsibility of allowing a ship of such unusual dimensions to go to sea without further inquiry.' On the 2nd May, Mr. Mills wrote: 'May I respectfully suggest that others of the Board staff who have experience of the trade this vessel is intended for should be sent to see her at once. The case is a heavy one for me to be left with alone; besides the

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opinions of Mr. Wimshurst and myself as given in our report might not be in accord with that of others.'

"Evidence was given that the ship had formerly brought cattle on deck from America, covered or protected by a moveable wooden awning or shed, and that shortly before May, 1881, the plaintiffs had replaced this by a permanent structure, said to be lighter, made partly of iron and partly of wood, to act as a shed or an awning for cattle, and that the ship was intended to bring cattle on deck in such shed from America to England on a homeward voyage. The ship was provisionally detained on May 14. By a report dated May 16, signed by Mr. Wimshurst, principal surveyor of iron vessels, by Laslett, Brown, and Panton, shipwright surveyors, and by Vyvian, nautical surveyor, the grounds of the provisional detention were stated to be 'improper construction, viz., unusual proportions,' and after giving the length, breadth, and depth of the ship, there was a statement that 'these formed a proportion unknown in the Merchant Service in any other vessel.' The Lord Chief Justice left the following questions to the Jury: 1st. Had the Board of Trade, when the detention order was issued, reason to believe that the *City of Limerick* was unsafe for the outward voyage or for the homeward voyage.—Answer: No, to both branches of the question. 2nd. Was she unsafe in point of fact on the voyage to New York.—Answer: No. 3rd. Was the *City of Limerick* unsafe for the voyage from New York to England if loaded with an ordinary cargo of American produce, including as part of the cargo 500 head of cattle on the main or upper-deck?—Answer: No. 4th: Was there an absence of reasonable and probable cause, by reason of the condition of the ship, or the act, or default of the owners, for the past detention of the ship by the Board of Trade?—Answer: Yes. 5th. From what date was the ship in point of fact detained?—Answer: From the 14th May to the 11th June.

"The Lord Chief Justice in summing up the case to the jury, thus explained the fourth question: 'You would expect to find, as in my judgment you do find, that where there is a *bonâ fide* and honest action on the part of that great department of the State, if that action is wrong, and in a particular case inflicts hardship

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upon an individual, that individual, if the action of the Board of Trade is *bonâ fide* and has been upon reasonable grounds, for the general benefit, must suffer;' and again, 'the true question for you to consider is, had the Board of Trade, at the time when the vessel was detained, reason to believe, when they so acted, that the vessel was unsafe for her outward or her homeward voyage.' 'The true question is, what was present to their minds when they did detain; and I still more clearly, as I understand it, and I think rightly understand, therefore, Mr. Mills was wrongly informed, and Mr. Mills wrongly informed the Board of Trade, but remember, in my view, the question is not whether he wrongly informed the Board of Trade, but whether he did inform the Board of Trade, and whether it was reasonable for the Board of Trade to believe what he informed them.' 'The Board can only go by the reports of their people, and so long as they have reason to trust those people, and those people do not give them reason to doubt the trustworthiness of their report, or give them reason to doubt that they can be relied on, I do not see why they should be held blameworthy or responsible under this particular Act of Parliament.' The learned judge then left it to the jury to say whether the letters and reports of Mr. Mills and Mr. Wimshurst did give the Board reasonable ground to detain the ship. And he further said that if the question of the absence of reasonable cause was for him, he was of opinion that there was an absence of reasonable cause. The ground of this view of the learned judge, and a ground which he left to the jury to consider in order to determine their verdict, was that the report and letters did not express a determined opinion of Mr. Mills and Mr. Wimshurst that the ship was unsafe, but rather seemed to avoid, and, in his view, did avoid, giving such an opinion, and that it was not reasonable for the Board to detain the ship without having at least a definite opinion that the ship was unsafe.

"The same view is expressed by Mr. Justice Field. I think there can be no doubt that if the statements of the surveyors had been direct and pointed statements of fact, even although mistaken and although they had erroneously supposed that that was a deck which was not a deck, and that that which was merely a

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supplementary alteration was a new construction, or that that which they thought added seven feet to the depth of the ship was with reference to the question whether she was stable or not, erroneous, still, if all that had been positively stated to the Board of Trade by their respective officers, whose competency was not at all doubted, and they had taken it all into consideration, however unfounded or erroneous the views or statements of facts might have been, we should have thought that there would have been very strong evidence indeed to show that there was no absence of reasonable and probable cause. But relying on the same points as the Lord Chief Justice, namely that the surveyors declined to pledge their opinion that the ship was unsafe, he states that he cannot disagree from the finding that even subject to the manner of leaving the question to the jury there was an absence of reasonable and probable cause. Upon the argument before us many points were raised. In order the better to express my views on them I think it well to state in the first place my opinion on the construction of the statute. The first section with which in this case we have to deal is section 6. That section gives power to the Board of Trade, a high executive State department, to interfere with the rights of private subjects over their private property. It would be anticipated that the exercise of such a power, so as to be absolutely justified in the end, would be expressly confined to certain limited cases. In other words, that such a power so to be justified would only be given on the existence of certain conditions. And so we find that it is not given in respect of every British ship, but only where certain conditions exist with regard to a British ship. Where a British ship being in any port of the United Kingdom, is, by reason of the defective condition of her hull, equipments or machinery, or by reason of over-loading or improper loading unfit to proceed to sea without serious danger to human life, having regard to the nature of the service for which she is intended, any such ship hereinafter referred to as unsafe may be provisionally detained for the purpose of being surveyed and either finally detained or released. This is the part of the enactment which

ves the power, the remainder of the section deals with the anner in which the power thus given is to be exercised. The wer then is not given with regard to every British ship. ıe enactment is not that an absolutely justified power is given provisionally detain every ship which the Board of Trade ıs reason to believe is unsafe. If that be the construction en all this first part of the section has no effect, and there- re no practical meaning. The only ships which can justi- bly in the end be provisionally detained according to this eliminary part of the section, are those which satisfy the con- tion that for one or other of the reasons mentioned they are ısafe. But by sub-section 1, the Board of Trade, if they have ason to believe on complaint or otherwise that a British ship unsafe, may provisionally order the detention of the ship for e purpose of being surveyed. Here a power is given to the ıard to order the provisional detention if they have reason believe, &c. This must, if possible, be read so as not to destroy e immediately preceding enactment. The only way to read the o enactments together, so as to give effect to both, is to say that e Board may detain a ship if they have reason to believe she is ısafe; they would, in my opinion, be bound by their duty to the ate to detain a ship if they had reason to believe she was unsafe, t that the Board will be proved by the result to have detained the ip unjustifiably as against the owner, even provisionally, if in fact e ship was not by reason of one of the mentioned causes safe within the meaning of the section. I would remark here at it is perhaps possible that a ship may be unsafe within e meaning of the section for some cause other than one of e causes mentioned in the section, and if so such a ship, though safe, could not properly be provisionally detained. A question ıs raised as to whether the consideration of safety or want of it ıst be confined to safety or the want of it on an outward voyage. was urged that it must be by reason of the words 'unfit to oceed to sea' and from a port in the United Kingdom. But it ems to me that the words 'having regard to the nature of the rvice for which she is intended' enlarge the area of consideration. for any part of the service for which the ship is intended when

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she is about to leave a port in the United Kingdom, such service to be fulfilled before her return to the United Kingdom, she would be unsafe, it seems to me she ought to be provisionally and finally detained. If a British ship were about to sail in ballast to the Chincha Islands to there load and bring back a cargo of guano and she would be unsafe to human life to bring back such a cargo, it seems to me that she would be proceeding to sea for a service for which she was destined at the time of proceeding to sea and for the performance of which service she would be an unsafe ship. Or if a British ship were under charter to leave a British port in ballast to proceed to Spain to load ore and thence to proceed to some other country, it seems to me that it would be far too narrow a construction of the protection of human life intended by this statute, if such a ship might not be detained if with a cargo of ore she would be unsafe to human life. She would be about to proceed to sea destined to perform a service for which she would be unsafe. Sub-section 3 gives power to the Board of Trade to order 'the ship' to be finally detained either absolutely or until the performance of certain conditions. But the ship which may be so detained is a ship satisfying the conditions mentioned in the first part of the section. The conditions in the first part of the section are, therefore, conditions precedent to a perfect right to detain a ship either provisionally or finally. But they are not conditions precedent to a duty on the part of the Board of Trade to provisionally detain. The Board is bound to perform a duty to the State which is hazardous to this extent, that the performance of it may be shown by a result which, at the time, the Board could not foresee, to have been an unjustifiable act as against an individual. All the difficulty pressing upon the Board by reason of its duty to act on information which it cannot sift in time, and on its grave responsibility to the State if it allow an unsafe ship to go to sea, must be admitted. Nevertheless, in my opinion, the duty to act under such difficulties is imposed. Now although the action of the Board, unless justified by the result of inquiry, is an unjustifiable act as against the shipowner, yet if no particular remedy were given to him by this or some other statute, he would have no remedy. The wrongful act would be a wrongful act

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done by the members of a public department acting gratuitously, and in the performance of a public duty. Yet the injury done to a shipowner by the detention of his ship at the moment of her proceeding to sea is usually so enormous, that if it were allowed to be done with impunity against one whose ship was not in fact unsafe, and more than that was not in truth liable if the true facts were known to a just suspicion of being unsafe, such legislation would seem to be legislation of the highest injustice. A perfectly innocent individual would, by legislation, be greviously injured without redress. The legislature was placed in a position of great delicacy, it was anxious to protect certain subjects, it was bound not too arbitrarily to injure others. The result was section 10. By it, if it appears that there was not 'reasonable and probable cause by reason of the condition of the ship, or the act or default of the owner for the provisional detention of the ship, the Board of Trade shall be liable to pay to the owner of the ship his costs of, and incidental to, the detention and survey of the ship, and also compensation for any loss or damage sustained by him by reason of the detention or survey.' Several questions arise as to the meaning of this enactment. It clearly does not go so far as to say that the shipowner shall be compensated if, in fact, his ship was not unsafe. So to hold, would strike out the words 'that there was not reasonable and probable cause.' Does it say that he shall not be compensated if there was reasonable and probable cause present to the minds of the Board from information before them, though there was not reasonable and probable cause if the true state of facts had been before them? It seems to me that so to hold would strike out the words 'by reason of the condition of the ship, or the act or default of the owner.' In order to justify the suggested interpretation the action should have been 'if it appears that there was not reasonable and probable cause for the provisional detention of the ship, &c.' Then, although neither the apparent condition of the ship nor any apparent act or default of the owner would have given to any person of ordinary skill any reason to doubt the safety of the ship, yet if incorrect facts had been stated to the Board of Trade, either through want of skill to appreciate them, or through negligence, or even fraudulently, such

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facts, if they had been true, being sufficient to raise a reasonable doubt, the shipowner would be without remedy. A shipowner so absolutely innocent that not even by misfortune could his ship be an object of suspicion to a person of ordinary skill, would have been deeply injured without remedy. Such legislation would have inflicted frightful injustice. It may be hard but it is not unjust to say that if by misfortune or otherwise a ship does fairly present a suspicious aspect, the shipowner must bear the consequences. It seems to me that the words of the enactment, if effect be given to all of them, carry out the intermediate view, the hard view but not the unjust one. The true interpretation seems to me to be that if, upon the evidence given at the trial of what, by all means of examination possible under the circumstances in which the ship then was and all reasonable enquiries, might have been known though it was not to the Board of Trade, a person of ordinary skill would have had reasonable and probable cause so far to suspect the safety of the ship as to make it reasonable to detain her for the purpose of enquiry, the shipowner has no remedy given to him though his ship was, in fact, a safe ship; but if upon such evidence a person of ordinary skill would have had no reasonable and probable cause to suspect the ship, then compensation is given to the shipowner although the facts erroneously stated to the Board of Trade would, if correct, have given to a person of ordinary skill reasonable and probable cause to suspect and consequently detain the ship. This reading is, in my opinion, fortified by considering the next part of the section, which seems to be an enactment of recipro-cal liability imposed on the shipowner and which liability clearly depends upon the result and not upon any statements or appearances of facts. It seems to me to be also fortified by section 11. That section assumes that the Board of Trade may be liable to the shipowner, and may yet have a remedy over against a complainant. That would hardly have been enacted if, upon the facts asserted to the Board, there would be an absence of reasonable and probable cause to detain a ship and yet the Board should detain her. It is clear that if the ship was in fact safe, no question can arise as to whether the information laid before the Board was or was not sufficient to

give reasonable and probable cause to detain the ship. In such case the shipowner can have no right to compensation. A question was raised as to whether the Board of Trade could rely upon any other deficiency than the one stated in their notice of detention and of the reason for it. As for instance, if the reason given for the provisional detention were a leak in the bows of a ship could evidence be given at the trial, that although there was no such leak, there would have been apparent to any ordinary skilful observer a defect in the engines, or in the rudder, or in the masts. Putting upon section 10 the interpretation stated above, which seems to me to be the right one, I think that the suggested evidence could be given, subject no doubt to fair notice being given of it to the shipowner before the hearing. Another question raised was, whether the question of reasonable and probable cause ought to be left to a jury, or be decided by the judge. In my opinion, the question of reasonable and probable cause if material, is never a question for the judge, except in the case of a charge of malicious prosecution or false imprisonment. It is not unnatural that in those cases it should be left to him, because the question in those cases is, whether there was reasonable and probable cause to set the law in motion, or to act personally on it. But however that may be, it seems clear to me that from the very nature of the case the meaning of this statute must be, that it is a question for the jury, to the solution of which they may be assisted by expert evidence. To ask a judge whether upon certain measurements of length, depth, and breadth, a ship would have sufficient stability, or whether with a cargo loaded in a given form, she would be safe, is, on the face of the proposition, to my mind absurd. Another point raised was whether among others which might be proved in order to raise the question above stated as the question to be tried by the jury, the previous history of the ship as to antecedent behaviour might be proved. In my opinion it might. No reasonably skilled and careful engineer would, if anything struck him as amiss in a ship, fail in my opinion to ask whether what he observed had existed in previous voyages and whether it had affected the behaviour of the ship. The previous behaviour of the ship under the same conditions as would affect

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her on her proposed going to sea would, in my mind, be an obvious and necessary fact to be considered in determining whether she would be safe or unsafe. An objection was taken to the view of the statute which I think is the right one, on the ground that the legislature would be imposing a duty on the Board of Trade and obliging them to pay damages in respect of the performance of that duty, but this objection seems to be more formal than accurate. If the members of the Board of Trade were made by the decision personally liable, this objection would be formidable indeed, but in fact the duty is imposed on the Board, the damages are paid by the State. Upon the view thus expressed of the true interpretation of this statute, it follows that in my opinion the right question was not left to the jury.

"The verdict of the jury was taken upon the question whether it was reasonable in the Board of Trade to detain the ship for survey without a direct affirmation by the surveyors that in their opinion the ship was unsafe.

"The attention of the jury was not drawn to this question, namely, whether the facts with regard to this ship as she lay at Sunderland, which would have been apparent to a person of ordinary skill if he had had all means of examining her possible under the circumstances in which she lay at Sunderland and of enquiring about her and had used those means, would have, in the opinion of the jury, given to such person reasonable and probable cause, so far to suspect the safety of the ship for her outward or homeward voyage as to give him reasonable and probable cause to detain the ship for survey and enquiry, I am sorry to say under these circumstances that in my opinion there must be a new trial if the Board of Trade think it advisable. The appeal must in my opinion be allowed."

Lord JUSTICE COTTON: "Although I agree in the construction which has been put on the statute by my learned brother, I think it better to state the view which I take of it.

"Now this action is under the 10th section of the Merchant Shipping Act, 1876. The question we have to decide therefore is the construction of that section of the Act. Of course the other sections must be construed in determining what is the

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proper construction to be put on the principal section. The first section that we have to consider is the 6th section.

"The construction of the 6th section of the Merchant Shipping Act, 1876, is open to some difficulty. It has been contended that the vessel being in fact unsafe is a condition precedent to the exercise of all the powers given by the section. But this cannot, in my opinion, be the true meaning of the earlier part of the section which gives rise to this argument. For if this is the true construction, a vessel could not lawfully be detained even for the purpose of being surveyed, unless it is in fact unsafe. This is inconsistent with the first subdivision which expressly gives power to detain provisionally if the Board of Trade have reason to believe the ship is unsafe, and the contention is inconsistent with the first part of the section itself which assumes that a ship coming under the provisions of this part of the section may be released, which, in the case of a ship in fact unsafe, would not be right. The section is not very correctly framed, but I think its meaning is that a ship which the Board of Trade have reason to believe to be unsafe, may be detained, and after such investigation or enquiry as by the section is binding on the owner, either released or finally detained. The first part of the section in my opinion sums up, though not very accurately, the subsequent detailed provisions of the section.

"But though, as a matter of public policy, it was thought right that power should be given to the Board of Trade to detain provisionally ships reasonably believed by the Board of Trade to be unsafe, it was obvious that this might produce great hardship to owners of some vessel and the 10th section gives in certain cases to owners of vessels which have been detained, and which in fact are not unsafe, compensation by way of damages for their detention, this compensation being payable not by the officers of the Board but by the State out of the public funds. In this section the language used differs from that of the first subdivision of the 6th section. It is not 'if the Board had not reasonable cause' but 'if there was not reasonable and probable cause,' that is, if in fact there was not such cause, and it must exist by reason of the condition of the ship or the act or default of the owner. This in

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my opinion means that the existence of the cause is not to be decided on the representations made to the Board of Trade, on which they acted, but is to be decided on the actual condition of the vessel or on what has in fact been done by the owner so as to prevent the owner being injured by reason of inaccurate representation made to the Board of Trade either by the officers or by strangers even in cases where the Board has properly discharged the public duty which the Act enables and requires the Board to discharge, and this is supported by section 11. Then comes the question by whom is the existence of reasonable cause to be decided, by the judge or by the jury? This does not depend on matters of which a judge has any special knowledge as is the case where the question is whether there was probable cause for a criminal prosecution. In my opinion, therefore, it must be decided by the jury and I think the question for the jury (when a vessel is said to be unsafe by reason of its condition) is, whether a reasonable man with a competent knowledge of ships would have believed from the actual condition of the ship that she was unsafe.

"In some cases the construction of the vessel without any reference to her previous history may be sufficient to enable the jury to decide the question and, in my opinion, it cannot be said that in all cases evidence ought to be given as to the history of the vessel, but I think that evidence as to the actual history of the vessel is admissible to show that she is or is not unsafe or that there was or was not reasonable and probable cause for believing her to be unsafe.

"The only other question is whether in deciding whether there was reasonable and probable cause for believing the ship to be unsafe regard is to be had to the outward voyage only. In my opinion where the contemplated employment of the vessel is for a purpose which involves more than the outward voyage as in the present case, the bringing cattle home from the United States, or, in other words, employment in the foreign cattle trade, this employment after the end of the outward voyage is part of the service for which she is intended and must be taken into consideration. Full protection would not otherwise be secured to seamen employed in British ships and, having regard to the words

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quoted from section 6, it is written the fair interpretation of the Act.

"The result of my opinion is that in the present case the proper question was not left to the jury, and that the verdict cannot stand. The defendants desire to contend before a jury that the ship was not in fact safe, that is, to question the finding of the Court of Enquiry. This they did not on the previous trial do, in consequence of an expression of opinion by the Lord Chief Justice that the question was whether the Board of Trade had reasonable ground, on the statement submitted to them, for believing that the vessel was unsafe, and the defendants ought, if they desire it, to have an opportunity of raising the question. There must, therefore, be a new trial."

Lord Justice BRETT: "The result of this judgment is peculiar. No doubt the Board of Trade have succeeded in obtaining a new trial, but they have obtained it on the ground that we have construed the Act more strictly against the Board of Trade than the learned judges in their consideration of the case in the Court below thought it right to do, and more strictly than the learned judge did at the trial. The Board of Trade have, therefore, not maintained the proposition which they submitted to us, and which they have endeavoured to maintain. Under these circumstances there will be no costs of the Appeal. The costs of the trial will be costs in the cause. There will be no costs on either side of the argument in the Court below or here, the costs of the former trial will abide the event of the new trial if the Board of Trade think it advisable to have one."

AGADIR, MAROCCO.

IT is probable that at an early date the Emperor of Marocco will open the port of Agadir (Santa Cruz) for the purposes of trade.

Orders have been sent to Casablanca, Mazagan, and Saffi to collect large quantities of wheat and barley at each of these ports, and have them ready for shipment at Agadir, whither

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a number of masons and boat builders have been sent from Mogador, besides a number of officers and workmen. Arrangements are being made for the collection there of a number of lighters for the purpose of communicating with shipping. This event will bring about the fall of the Mogador produce trade (a port some distance to the north of Agadir), yet the Sultan will be materially benefited thereby, inasmuch as Agadir, being his most southern port, will serve as a good shipping harbour for all the valuable produce of Sus and Wad-Nown, which of late years has not reached Mogador in the former quantities, owing to the unsafety of the roads, and therefore had to be carried to Cape Juby. At the same time the Sultan hopes that, by opening this port on the extreme borders of Marocco and Wad-Nown he may induce the sheiks to abandon the idea of opening independent ports for themselves.

The British company at Cape Juby, by virtue of a treaty with the chiefs of that territory, have been authorized to open a traffic upon which no duties whatever are paid upon imported or exported goods, much against the will and efforts of the Sultan of Marocco, who claims sovereignty over those independent tribes. The Bay of Agadir, or Santa Cruz, is the best roadstead on the coast of Marocco, having a moderate depth of water, and being completely sheltered from all winds except those from the westward. It abounds in fish of various kinds, of which great numbers are caught, salted, and sent to Mogador and the interior, and now form the sole article of trade of this once flourishing place. Provisions are good and plentiful, and abundant good water at hand.

Agadir or Santa Cruz, in lat. 30° 20′ N., lies S.S.E. ¾ E. distant 18 miles from Cape Ghir, and is the southernmost port of Marocco on the Atlantic ocean.

The town, which stands on the summit of the mountain, is strong by nature, and its walls are defended by ancient batteries with obsolete guns; the principal battery, now in ruins, is at a short distance from the town, down the mountain, and was originally intended to protect a fine and abundant spring of fresh water, close to the sea. This battery also commands the approach to the town, both from the north and south, and the shipping in the bay.

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Convenient anchorage, in 7 or 8 fathoms water and about a mile off shore, will be found with the castle bearing N.N.E. The southerly *current* prevailing along the coast of Marocco is not felt when abreast of Agadir until at the distance of 6 to 7 miles from the land, being deflected by the projection of Cape Ghir.

The articles of trade which will be exported from Agadir when open to commerce are sweet and bitter almonds, beeswax, gum Barbary or Arabic, gum sandarac, gum sandan, gum euphorbium; calf, cow, and goat skins, and skins of wild animals; pomegranate peels, citrons, olive and argon oils, marocco leathers, dates, worm seed, orris-root, ostrich-feathers, cummin-seed, ivory, ambergris, wool, cattle, and grain, and some gold, silver, and copper ores; these ores abound in the Atlas. In return for these articles of exportation and others not mentioned, the traders will import various kinds of linens and cotton goods, white and blue sallampores, American cloth, and long cloth, sugar, tea, glasses, coral beads, amber beads, pearls, shells, silks, brass and iron, wool and cotton manufactures, in imitation to those of Fez. nutmegs, cloves and ginger, tobacco, beef, salt, and many other commodities.

APPROXIMATE TABLES OF FREEBOARD.

Memorandum for the Guidance of the Board of Trade Staff.

Introduction.

THE following Memorandum and Tables were prepared by Sir Digby Murray, and by him were circulated amongst the Officers of the Staff of the Board of Trade for their confidential use.

Experience has shown that they may now be sanctioned by the Board of Trade for the purpose intended, that is to say, for the fixing of points of departure in requiring ships to be lightened

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which may be detained as overladen under the Merchant Shipping Acts.

1. The following tables do not take into consideration the additional freeboard required by vessels of little stability when carrying light homogeneous cargoes such as coal or grain.

2. Although general rules are given for spar and awning-decked vessels, it is evident that as all such cases as these depend on either form or strength of construction, each ship must be considered separately on her own merits, and that these rules can only be regarded (as their name implies) as points of departure or reference to facilitate the necessary calculations.

3. In calculating the freeboard of vessels of intermediate length and tonnage by the following tables a proportionate difference in the freeboard is to be allowed.

In the case of ships having curved stems and cutwaters the surveyors should make a deduction from the length of the ship of the extra length over all, so as to place such ships on equal conditions with ships having straight stems.

4. These tables are intended for first-class ships of ordinary construction, possessing good sheer, the usual deck camber, and normal depth of floors.

For any excess in or diminution in the above respects, due allowance must be made by the surveyor. Average deck camber is for this purpose to be considered $\frac{1}{4}$ inch per each foot of beam.

Normal depth of floor is to be considered 1 inch per foot of the vessel's registered depth to upper deck, such deck not being an awning-deck.

5. Calling the specific gravity of the Atlantic 1028, the difference to be deducted from the freeboard required by the foregoing tables in the case of vessels loading in *fresh* water would be $\frac{1}{36 \cdot 7}$ of the ship's mean immersion in feet and inches; but as the water in which ships load is rarely quite fresh, and the form of the bottom is not uniform for each foot of depth, one quarter of an inch for each foot of immersion will, for general purposes, be a sufficiently near estimate. When the water is brackish a less allowance must of course be made. For instance,—say a vessel at Glasgow

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drawing 16 ft. of water is required by the scale to have 3 ft. of freeboard in salt water—

	ft.	in.	
	3	0	
Deduct ¼ in. per foot immersion	0	4	
	2	8	Freeboard when loaded at Glasgow.

POINTS OF DEPARTURE FOR THE INFORMATION OF SURVEYORS.

STEAMSHIPS.

Length.	Summer.	Winter.	North Atlantic Winter.	Remarks.
Feet.	A Inches and tenths to foot depth.	B Inches and tenths to foot depth.	C Inches and tenths to foot depth.	
180 and under	1·8	2·0	2·2	A minimum table for first class ships, to be increased in vessels where, in the judgment of the Surveyors, weakness of construction or excessive proportions renders it necessary.
200 - -	1·9	2·1	2·3	
225 - -	2·0	2·2	2·4	
250 - -	2·2	2·4	2·6	
275 - -	2·4	2·6	2 8	
300 - -	2·6	2·8	3·0	
325 - -	2·8	3·0	3·2	
350 - -	3·0	3·2	3·4	
375 - -	3·2	3·4	3·6	
400 - -	3·4	3·6	3·8	
425 - -	3·6	3·8	4·0	
450 - -	3·8	4·0	4·2	

In applying the above table the depth of hold is to be taken to the maindeck in spar and awning-decked ships, and in all other ships to the upper deck. This depth can be taken from the Certificate of Registry.

Freeboard is the actual height of the side of the deck above the water, whether the deck is of wood or iron. Therefore, if the deck is of iron the freeboard is to be taken to the upper surface of the iron deck at the side of the ship next the waterway at the lowest part of the side, and no allowance is to be made for what would have been the height of the surface of the deck above water if instead of being of iron it were of wood.

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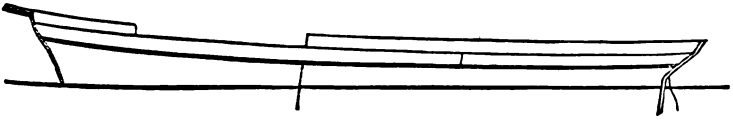
Freeboard as ascertained by the above Table is to be measured from the water line to the top of the deck at the waterway of the upper deck amidships; excepting (1) that in spar-decked ships and awning-decked ships freeboard is to be measured to the top of the deck at the waterway amidships, of that deck to which full scantlines are carried: and (2) that in the case of ships having long poops, raised quarter-decks, or breaks exceeding half the length of the ship, and provided that the forward side of the break is protected by a substantial and efficient iron bulkhead, the freeboard is to be measured just forward of the break as shown in the diagram, that being the lowest part of the exposed deck.

This plate represents a vessel with a long poop. The same principle holds good to a raised quarter-deck or break-deck.



Point at which the freeboard is to be measured.

In ascertaining the freeboard for first-class spar-decked steamers, allow one-third the freeboard as ascertained by Columns A, B, and C. The measuremont to be always taken to main deck. For steamers falling short of the usual requirements for first-class spar-decked vessels a proportionate increase is to be made at the discretion of the Surveyor.

In ascertaining the freeboard for awning-decked steamships, if of approved construction, allow two-thirds the freeboard as ascertained by Columns A, B, C, always at the discretion of the Surveyors; the freeboard so ascertained to be measured to main deck.

For long poops, when extending half the length of the ship, allow a deduction of four inches from the freeboard as above ascertained.

For raised quarter-decks or break-decks joining bridge-decks or otherwise, if extending half the length of the ship, deduct three inches.

Shorter lengths of poops, raised quarter-decks, or breaks, a proportionate allowance.

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For high combings, exceeding 24 inches in height, if accompanied by superior deck fittings, deduct one inch.

SAILING VESSELS.

Under-Deck Tonnage.	Iron and Hard Wood.	Soft Wood.	Remarks.
Tons.	D Inches and tenths to foot depth.	E An addition of two tenths.	This table except in vessels of very great sheer is intended to be a minimum to be increased when in the judgment of the Surveyor age or weak construction renders it necessary. An allowance should undoubtedly be made for great sheer especially in small vessels and this must be left to the judgment of the Surveyor. No vessel is so uneasy in a seaway as a clipper ship loaded deep; therefore a sailing vessel of great rise of floor and fine ends should not be allowed to load more deeply than an ordinary vessel, if anything, the reverse.
50 and under	1·6	1·8	
75 - -	1·7	1·9	
100 - -	1·8	2·0	
150 - -	1·9	2·1	
200 - -	2·0	2·2	
250 - -	2·1	2·3	
300 - -	2·2	2·4	
400 - -	2·3	2·5	
550 - -	2·4	2·6	
700 - -	2·5	2·7	
850 - -	2·6	2·8	
1,000 - -	2·7	2·9	
1,200 - -	2·8	3·0	
1,400 - -	2·9	3·1	
1,600 - -	3·0	3·2	
1,800 - -	3·1	3·3	
2,000 - -	3·2	3·4	
2,200 - -	3·3	3·5	
2,400 - -	3·4	3·6	
2,600 - -	3·5	3·7	

T. H. FARRER, *Secretary.*

THOMAS GRAY, *Assistant-Secretary, Marine Department.*

[The foregoing tables were, it appears, intended solely for the guidance of the Board of Trade staff: the publication of them does not therefore convey to the reader any precise information as to the conditions under which they are used by the surveyors and detaining officers in arriving at an approximate estimate. For instance :—

(1.) The freeboard required for steamships clearing under the Passenger Acts is practically settled by the Board of Trade through the emigration officers at the ports on careful survey. Therefore the tables do not apply to them.

(2.) The rule, if it can be called a rule, as to the freeboard

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required for "spar" and "awning" decked steamships, does not apply to large vessels of these types in the passenger trade.

(3.) The factors for determining the freeboard of sailing ships have clearly been purposely increased about 3 per foot of depth for the larger class of vessels, with a view of not tying the surveyors down too closely to a fixed minimum in the case of distressing cargoes, or in the case of structural weakness, of which the officers who are on the spot must necessarily always be the best judges.

It does not appear to have been thought necessary to add this increase in the case of the steamships, probably for the reason that their loading had to be considered for summer, and for winter, as well as for those most trying of all voyages, across the North Atlantic in winter time.

It seems to us, therefore, that the tables are intended to be regarded simply and purely as points of departure, subject in all cases to the judgment of the surveyors and the principal officers, and such other advice and instruction as they may receive direct from the Board of Trade from time to time.

The broad question as regards all schemes of freeboard is this —that suggestions as to points of departure may with advantage be framed for the guidance of competent technical officers, but that each case in which these points do not wholly apply must be settled on its own merits; and we believe it is wholly and completely true, notwithstanding all columns of figures and all theories as to surplus buoyancy, that the sailors who sail ships are the only people whose opinion is worth anything as to their behaviour at sea. It is a matter of regret that in our principal registry societies there are no independent seafaring men whose opinions are regarded. Shipbuilders, surveyors, shipowners are consulted; but the real nautical man who has to incur the risks is absolutely nobody with them.—Ed. *N.M.*]

STEAM BOILERS ACT.

[We print this Act *in extenso* for the reason that it applies to boilers on board all ships not having certificates from the Board of Trade. Also to all those numerous crane and donkey boilers which are used in connection with the loading and repairs of ships. Harbour authorities, lightermen, shipowners, dockowners, repairers of ships, &c., &c., should make themselves acquainted with its provisions. It, of course, applies to boilers of threshing machines, merry-go-rounds, traction engines, engines for electric lights, &c., &c., and under it the term "boiler" not only means a receptacle in which liquid is heated, but means all pipes and closed receptacles into which steam is admitted.—Ed. *N. M.*]

(45 *and* 46 *Vict., chap.* 22.)

AN ACT TO MAKE BETTER PROVISION FOR INQUIRIES WITH REGARD TO BOILER EXPLOSIONS.

[July 12, 1882.]

WHEREAS special provision has been made by law for making inquiry into the causes and circumstances of boiler explosions on board ships and on railways, and it is expedient that like provision be made for making inquiries with respect to boiler explosions in other cases:

Be it therefore enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

1. *Short title.*—This Act may be cited as the Boiler Explosions Act, 1882.

2. *Extent of Act.*—This Act shall extend to the whole of the United Kingdom.

3. *Interpretation of terms.*—In this Act the term "boiler" means any closed vessel used for generating steam, or for heating water, or for heating other liquids, or into which steam is admitted for heating, steaming, boiling, or other similar purposes.

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The term "court of summary jurisdiction" means any justice of the peace, metropolitan police magistrate, stipendiary magistrate, sheriff, sheriff substitute, or other magistrate or officer, by whatever name called, who is capable of exercising jurisdiction in summary proceedings for the recovery of penalties.

4. *Application of Act.*—This Act shall not apply to any boiler used exclusively for domestic purposes, or to any boiler used in the service of Her Majesty, or to any boiler on board a steamship having a certificate from the Board of Trade, or to any boiler explosion into which an inquiry may be held under the provisions of the Coal Mines Regulation Act, 1872, and the Metalliferous Mines Regulation Act, 1872, or either of them.—35 & 36 *Vict.*, *c.* 76; 35 & 36 *Vict.*, *c.* 77.

5. *Notice of boiler explosion to be sent to the Board of Trade.*—(1.) On the occurrence of an explosion from any boiler to which this Act applies, notice thereof shall, within twenty-four hours thereafter, be sent to the Board of Trade by the owner or user, or by the person acting on behalf of the owner or user.

(2.) The notice shall state the precise locality as well as the day and hour of the explosion, the number of persons injured or killed, in addition to the purposes for which the boiler was used, and, generally, the part of the boiler that failed, and the extent of the failure, and such other particulars, if any, as the Board of Trade by notice inserted in the *London Gazette* may require, and shall be in the form printed in the schedule to this Act, or in such other form as the Board of Trade may from time to time approve for the purpose.

(3.) If default is made in complying with the requirements of this section, the person in default shall, on summary conviction, be liable to a fine not exceeding twenty pounds.

6. *Power for Board of Trade to direct inquiry as to boiler explosion.*—(1.) On receiving notice of a boiler explosion the Board of Trade may, if it thinks fit, appoint one or more competent and independent engineer or engineers, practically conversant with the manufacture and working of boilers, to make a preliminary inquiry with respect to the explosion, and the persons so appointed shall have the powers conferred on the court by sub-section (4) of this

section. If it appears to the Board of Trade, either upon or without such preliminary inquiry, that a formal investigation of the causes and circumstances attending the explosion is expedient, the Board of Trade may direct a formal investigation to be held; and with respect to such investigation the following provisions shall have effect:

(2.) Formal investigations of boiler explosions shall be made at or near the place of such explosion by a court consisting of not less than two commissioners appointed by the Board of Trade, of whom one at least shall be a competent and practical engineer specially conversant with the manufacture and working of steam boilers, and one a competent lawyer. The court shall be presided over by one of the commissioners, the selection being made by the Board of Trade.

(3.) Any such formal investigation shall be held in open court, in such manner, and under such conditions, as the commissioners may think most effectual for ascertaining the causes and circumstances of the explosion, and for enabling them to make the report hereinafter mentioned in this section.

(4.) The court shall have, for the purpose of its investigations, all the powers of a court of summary jurisdiction when acting as a court in the exercise of its ordinary jurisdiction, and shall in addition having the following powers; viz.,

(*a.*) The court, or any one appointed by it, may enter and inspect any place or building, the entry or inspection whereof appears to the court requisite for the said purpose:

(*b.*) It may by summons under its hand require the attendance of all such persons as it thinks fit to call before it, and examine for the said purpose, and may for such purpose require answers or returns to such inquiries as it thinks fit to make:

(*c.*) It may require and enforce the production of all books, papers, and documents which it considers important for the said purpose:

(*d.*) It may administer an oath, and require any persons examined to make and sign a declaration of the truth of the statements made by him in his examination:

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(*c.*) Every person so summoned, not being the owner or user of the boiler, or in the service or employment of the owner or user, or in any way connected with the working or management of the boiler, shall be allowed by the Board of Trade such expenses as would be allowed to a witness attending on subpœna before a court of record, and in Scotland to a witness attending a criminal trial by jury in the sheriff court; and in case of dispute as to the amount to be allowed, the same shall be referred by the court to a master of one of the superior courts, and in Scotland to the auditor of the Court of Session, who, on request under the hands of the members of the court, shall ascertain and certify the proper amount of such expenses.

(5.) The court making a formal investigation with respect to any boiler explosion, shall present a full and clear report to the Board of Trade, stating the causes of the explosion, and all the circumstances attending the same, with the evidence, adding thereto any observations thereon, or on the evidence, or on any matters arising out of the investigation which they think right to make, and the Board of Trade shall cause every such report to be made public in such a manner as it thinks fit. When no formal investigation is held, the report presented to the Board of Trade by the engineer making a preliminary inquiry with respect to a boiler explosion shall be made public in such manner as the Board of Trade thinks fit.

7. *As to costs and expenses of inquiry.* — The court may order the costs and expenses of a preliminary inquiry or formal investigation or any part thereof, including therein the remuneration of persons holding such inquiry or investigation, to be paid by any person summoned before it, or by the Board of Trade; and such order shall, on the application of any party entitled to the benefit of the same, be enforced by any court of summary jurisdiction as if such costs and expenses were a penalty imposed by such court.

The Board of Trade may, if they think fit, pay to the persons holding any inquiry or investi gation under this Act such remuneration as they may with the consent of the Treasury appoint.

If and so far as not otherwise provided for, all costs and expenses incurred by the Board of Trade, including any remuneration paid

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under this section, and any costs and expenses ordered by the court to be paid by the Board of Trade, shall be paid out of moneys to be provided by Parliament.

8. *Recovery of fines.*—Any fine payable under this Act shall be recoverable in England in the manner provided by the Summary Jurisdiction Acts (27 & 28 Vict., c. 53), in Scotland in the manner provided by the Summary Jurisdiction Acts, 1864 and 1881 (44 & 45 Vict., c. 33), and of any Act or Acts amending the same, and in Ireland within the police district of Dublin metropolis, in accordance with the provisions of the Acts regulating the powers and duties of justices of the peace for such district, or of the police of such district elsewhere in Ireland in accordance with the provisions of the Petty Sessions (Ireland) Act, 1851 (14 & 15 Vict., c. 93), and any Act amending or affecting the same.

SCHEDULE.

REPORT of EXPLOSION of a STEAM BOILER to be sent to the BOARD of TRADE within twenty-four hours after the occurrence of an EXPLOSION.

See Section 5.

1. Name of premises or works on which the boiler exploded.
2. Address by the post.
3. Day and hour of explosion.
4. Number of persons killed.
5. Number of persons injured.
6. General description of the boiler.
7. Purposes for which the boiler was used.
8. Part of the boiler which failed, and the extent of failure generally.
9. Pressure at which the boiler was worked.
10. Name and address of any society or association by whom the boiler was last inspected or insured.

Signature of person responsible for the accuracy of the particulars contained in this form.

Address_____

Date_____

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OUR LIBRARY TABLE.

WE have on our table the following works, pamphlets, and papers relating to nautical matters :—

Annalen der Hydrographie und Maritimen Meteorologie, Heft. VI., which contains a good analysis, by Professor Weyer, of Sir G. B. Airy's new method of clearing a Lunar Distance. *Van Nostrand's Engineering Magazine* (New York), for July. *Boletin de la Sociedad Geográfica de Madrid* (June). *Annales Hydrographiques*, 1er semestre, 1882 (Paris). *Tableau des Distances de Port à Port*, published by the French Hydrographic Office (Paris, Challamel, Ainé), giving the distances between all the principal ports of the world; a voluminous work of 585 pages, at the cost of 6 francs. *Abstracts of the Returns made to the Board of Trade of Sea Casualties*, 1880-81 : this is a new and more imposing title for the useful publication formerly known as the Wreck Register ; an analysis of its contents is given in the present number of the *Magazine*. We would draw the special attention of our readers to the last new work issued by the Meteorological Office, viz., *Meteorological Charts for the Ocean District adjacent to the Cape of Good Hope*, accompanied with *Explanatory Remarks:* an analysis of this carefully compiled work will appear in our next number. *Revue Maritime et Coloniale* (Paris), June. The latest numbers of the *New York Maritime Register*, *Le Yacht*, *Hansa*, and *Das Schiff*, are to hand.

We have also received a copy of the third edition of the Manual of Yacht and Boat Sailing, by Dixon Kemp, A.I.N.A., author of "Yacht Designing." We have much pleasure in noticing a third edition of this valuable standard work. Space devoted in the first and second editions to Displacement, Stability, &c., has been in consequence of the treatment of those subjects in a separate work, rendered available for the introduction of much new matter, and the present volume is larger than either of its predecessors. We hope in the course of a month or so to give a more detailed notice of this work.

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CORRESPONDENCE.

CHANNEL NAVIGATION AND RULE OF THE ROAD AT SEA.

SIR,—In your article in this month's number of the *Nautical Magazine* on the above subject, you write—"Our desire like that of both our Correspondents, is that collisions should be avoided," and on such grounds, I have little hesitation in asking you to publish a few words of friendly criticism in reply.

I am very glad that you should endorse my opinion as to the *illegality* of the sailing vessel executing manœuvres in order to avoid the steamer, but I am bound to express my surprise that you should have said such an opinion is valuable "*as coming from me*," because I should think I have never written half a dozen pages without insisting on this *illegality*, and because my argument has always been that it ought not to be illegal; and because that is one of the arguments I press in my letter on which you found your article.

I have endeavoured to point out that had we retained our ancestors' rules, it would but have been illegal, as it is certainly safest, for the sailing vessel when in the least doubt to make a movement tending to take her under the stern of the steamer.

I am always glad when my critics come to diagrams for I am much of opinion that there will be no difference amongst us when we make diagrams which correctly illustrate and define our position. Take your Fig. 3 for instance to illustrate and define what I have just said.

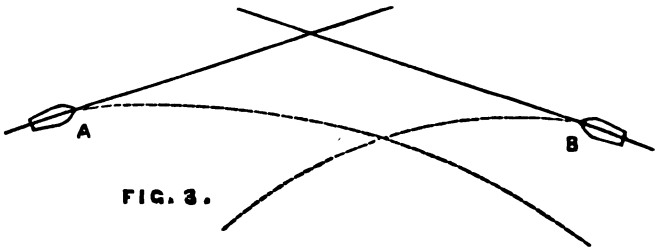

FIG. 3.

Let us suppose A to be the steamer and B the sailing vessel. It is lawful for A to continue her course if she thinks—as she

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very often does—that that is the proper movement to keep clear of B. It is also lawful for A to starboard her helm to B. I want to make it *unlawful* for A to use starboard-helm and I want to tell her that if she does not port her helm to pass under the stern of B, and there is a collision, she will be condemned without further question.

But at present the law is as I have stated it. The words "keep out of the way" were substituted for the words "give way," on purpose to leave A free to choose her movement.

Well now B, a sailing vessel, has no guarantee that A will go along the dotted line marked out for her, and B may have clearer eyes and better judgment than A, and may be strongly of opinion that unless B takes the proper steps, she will be run down. But the law forbids her to take any steps. And in this I declare the law to be wrong, although so long as it is law it must be obeyed strictly.

But then you say—and many will say with you—"behold the result!" Meaning that if A—contrary to B's belief—ports; and B to ease herself, starboards, they are just as badly off as if neither had made any movement at all. They now come into collision where the dotted lines cross instead of coming into collision where the plain lines cross.

But a good many things must concur to bring this result about.—(1.) There must be a change in the colour of the lights seen, which must be disregarded by both ships. (2.) The ships must have equal turning powers. (3.) They must be equally distant in time from the crossing point. Unless all these things concur there will not be collision. And our ancestors knew very well that even when ships were more alike than they are now, and that although they had no coloured lights to exhibit distinct signals as to helm, there was very much less danger on the dotted lines in Fig. 3 up to the condition of parallel courses, than there was in either side *insisting* on keeping her course. And yet our ancestors compelled A to port her helm by law, which we do not.

But the unfortunate fallacy now lurking under the law as illustrated in Fig. 3, is that it is forgotten that in a great many cases of crossing ships it is utterly impossible for the ship ordered to

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"keep out of the way," to do so, while it is quite easy for the ship ordered to "keep her course" to avoid collision by making for the stern of the other. I have often said, and now repeat it, that a couple of nights' experiments with properly defended steam launches, would absolutely upset the present Rule of the Road. For it would then be impossible to resist the conclusion that a natural obedience to the signals made by the coloured lights forms the true rule of safety.

This brings me to your Fig. 2, where you say it would

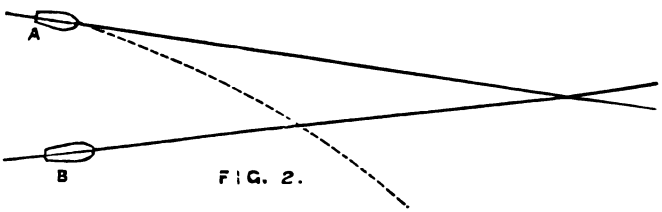

FIG. 2.

be "exceedingly foolish" for A to port to the red light of B. To which I answer, not at all foolish, and the proper and seamanlike helm to use. I have used it myself many scores of times. Naturally, A would not port, if he knew of any reason against it. Nor would he ever, as a seaman, be in a hurry to alter his helm to any light abeam. But if he did find himself in the position of A with regard to B he must pass under her stern at some time in order to continue his course, and port-helm is the proper helm to use. In the case before us, even with equal speeds, A would pass under the stern of B, but it might, of course, be her duty to reduce speed, or even, if a steamer, to reverse her engines. The movement is always safe except in cases of extreme proximity, or excess of speed on the part of A great enough to prevent her passing under the stern of B.

But Fig. 2 is a little beside the question; for A does not drop from the clouds abeam of B, and two or three ships' lengths off only. Either she has seen B coming up, or else she has herself come up on B's quarter, in sight of her white stern light, and possibly her red light as well. In such a case

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we should have had her using port-helm before she neared B, or else using no helm at all, if she had seen B coming up, so that there is nothing in this figure to mar the force of the excellent maxims, "Never starboard to a red light," and "Never port to a green light," and we see that, even reduced to diagram, we confirm the historical fact that collisions only occur when these maxims are disobeyed; as represented, for instance, in Fig. 8.

But as you have been good enough to show the accord that there is between some of my opinions and those published in Mr. Gray's last book (1878), you will permit me to say how gratified I was in reading the words you quote when the book first came out. I was only sorry that Mr. Gray should not have withdrawn his former opinions in formulating these later and more correct ones. Unfortunately, he left it open—even in that book—for folks to quote his opinion that it was "proper" to *starboard* to a red light. Unfortunately, too, the Courts do not follow Mr. Gray's amended opinions yet. By-and-bye they will, and then we shall have the simplified and definite Rules of the Road which are called for.

I am, Sir, yours obediently,

July 8, 1882. P. H. C.

[While publishing the above letter as an interesting contribution for discussion and speculation, we do not hold ourselves responsible for the opinions it contains. We trust that all shipmasters will follow the Rule of the Road with strictness in practice if they desire to avoid collisions, and if they wish to be held free from blame in the Admiralty or Wreck Inquiry Court. It is stimulating to the shipmaster's intellect to discuss matters relating to the Rule of the Road with so able and fluent a writer as "P. H. C." so long as the speculations, opinions, and theories, which find expression in discussion, do *not* lead to a disregard of the law in practice. There is no doubt as to the meaning of the Rules as they now stand, and we cannot but regard discussions of their principles as the means of affording opportunities for intellectual and speculative effort rather than as having at this date any practical value.—Ed. *N. M.*]

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LAYING-TO IN A GALE.

To the Editor of the "Nautical Magazine."

DEAR SIR,—If your correspondent "B. O. T." will be good enough to state in a dozen lines, his own practical knowledge of the "handling of screw steamships in a gale" I shall be very glad, with your permission, to "give my candid opinion on this new theory," but I must state that gales in which "he shortened sail and brought his ship to the wind under lower fore-and-main topsails" are not the sort of gales in which first-class screw steamers in the North Atlantic trade are obliged to decide whether to stop the engines and lay-to, or to continue steaming head into the gale with the risk of serious damage.

I have not the time and I am sure the *Nautical Magazine* has not the space for the discussion of this subject upon which perhaps, depends the safety of hundreds of lives and an incalculable amount of property, with anonymous correspondents, who have theory but no real practical knowledge of the handling of a screw steamship "when the sea becomes so heavy that serious damage is apprehended, or liable to be encountered."

J. W. SHACKFORD, S.S. *Illinois.*

Liverpool, July 12th, 1882.

LAYING-TO IN A GALE.

To the Editor of the "Nautical Magazine."

DEAR SIR,—My former shipmate's letter appears to be exciting a great amount of criticism, a sure sign that there is more in it than those who would fain condemn it without a trial are inclined to admit. Any innovation, be it right or be it wrong, is certain to meet with similar treatment, consequently, Shackford having formulated the idea must allow others to condemn or approve of its practical utility. Time has wrought many changes in the handling of vessels. At the close of the last century full-rigged ships, a few of which are still afloat, were hove-to under a reefed square mainsail, a practice which a seaman of the present day would not even take the trouble to discuss. I am under the impression that the foundering of many of Lord Rodney's fleet in a hurricane

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off St. Domingo, first called attention to the helplessness of a ship when taken aback with her canvas set. Reid says (I quote from memory): "The wind suddenly shifted and every ship with a square mainsail set gathered stern-way and foundered." If it were possible to refer to the opinions of the officers of the period, it is pretty certain that a large number would absolutely condemn the innovation made by substituting the topsail, as dangerous and unnecessary. "Nothing like an old musket," says the soldier; "Except an old tackle," says the sailor. It would be unreasonable to infer that an universal rule governs the heaving-to of every class of ship. Commanders should carefully study the behaviour of their charge under every possible condition of trim and weather, and if they find by experience any particular manœuvre applicable to the situation, by all means let it be carried out. One example in favour of Shackford's suggestion has already been given; I will relate another where its adoption would have culminated in disaster. The ——— a razeed ninety-gun ship, cut down, was the first complete ironclad which crossed the Atlantic. The dockyard authorities ridiculed the idea of boxing up the old fashioned channels, and discredited the report that the mainyard was defective; indeed the writer received a quiet wigging for suggesting otherwise. In 35° W., one of the ordinary Atlantic gales set in rather suddenly, with, after the usual shift of wind from S.W. to N.W., a heavy cross sea. The ship was hove-to in the orthodox fashion, with a reefed down maintopsail and trysails. During a squall of some violence the mainyard was carried away on the weather quarter, and in a few minutes the heavy rolling, some 35° each way, burst up the fore and main channels. According to the custom in H.M. service the masts were very properly wedged on all decks, thus enabling them to stand unsupported by rigging the tremendous strain to which they were subjected for some time. When the steam was under command the ship's head was brought up to the sea, and she behaved remarkably well throughout the gale. Now the conditions here were very different from those of an ordinary cargo steamer. Her metacentric height was at least seven feet, and it is doubtful if an ordinary cargo steamer has, when

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homogeneously loaded, one-third of that amount. Steadiness in a seaway depends in a very great measure on this factor; the two cases, therefore, do not admit of comparison.

It is pretty generally admitted that all long sailing ships fall off into the trough of the sea and gather headway until the action of the rudder again brings them up to within six points of the wind; thus they are constantly in a similar position to the steamer with her engines stopped. Owing to the excess of top-hamper the former have the great advantage of superior drift, hence their chances of escaping unscathed are greater. The writer of a letter in the July number has unconsciously confirmed what he attempted to confute by stating that commanders of sailing ships, in their laudable anxiety to make a passage, often keep off on their course before it is prudent to do so, and are fortunate if they are again enabled to round-to without material damage. Exactly so, it is the pace that kills, and whether the power be derived from sail or steam the results are similar. As I stated in a former letter, the movement of the engines in a low-powered steamer diminishes the drift without bringing her head into what is deemed the most favourable position for boring the sea, whatever that may be. Owing to this, the luckless hull somewhat resembles a breakwater, and when we remember that the sea at Wick has actually broken off and rolled over blocks of concrete weighing two or three thousand tons, the advisability of placing a ship in a position of comparative rest appears very questionable. One of the ablest captains in the Atlantic trade who commands one of the largest steamships engaged in it, recently made the following remark in allusion to the November gale: "After losing boats, washing away skylights, and partially filling the saloon I stopped engines and was surprised to find that no more water broke on board." Such evidence from such an officer cannot be lightly gainsaid by any theoretical reasoning. The anecdote of the little craft of 800 tons heading (nearly) the tremendous sea by the aid of the "propeller going easy" and "fore-and-aft sails" in a "tremendous sea" will astonish men who, in ships of six or seven hundred nominal horse-power, to perform a like feat are compelled to use all the power that the engineer deems compatible with safety to

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the machinery. And with respect to the canvas it may be safely asserted that during very strong Atlantic gales the best fails to stand against the wind pressure aided by the motion of the ship as she rises and falls to the sea.

It is difficult to see by what is recorded in the same letter in what manner the behaviour of the sinking steamer off Scilly affects the question. A waterlogged vessel is swayed by the slightest movement of wind or sea regardless of the position she lies in. Anyone can prove this practically by stepping on the thwarts or *gunwale of a* swamped boat in still water. Of course, if according to Shackford's recommendation this steamer was hove-to with the engines stopped, and subsequently became overwhelmed by the sea, it is evident that the manœuvre was as unfitted for her as it was for the ironclad. But until it is proved that such was really the case, it is neither logical or reasonable to attempt to bracket the events together. Let us argue every case fairly and temperately on its merits and the true solution will eventually be reached by someone.

W. W. KIDDLE.

CORRECTION OF THE TIME OF THE MOON'S MERIDIAN PASSAGE FOR LONGITUDE.

To the Editor of the "Nautical Magazine."

SIR,—There is an error in many of our Nautical Tables which with your permission I will point out.

I refer to the Table for Correcting the Time of the Moon's Meridian Passage for Longitude.

It is evident that between two successive transits of the Moon over the same Meridian, the Moon must pass all the intermediate places later and later by a proportional part of the daily variation. This daily variation applies throughout the whole circumference, or in other words, to a difference of longitude equal to 360° or 24 hours. Therefore the formula for the correction is :—

$$\text{Correction in minutes} = \frac{\text{Longitude in degrees} \times \text{daily variation (or retardation)}}{360}$$

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The erroneous Tables seem to be founded on the following expression :—

$$\text{Correction in minutes} = \frac{\text{Longitude in Time} \times \text{daily variation}}{\text{Length of lunar day.}}$$

Many Tables have been published giving the corrections for this daily variation, but very few of those in constant use are correct. The first I find giving a Table of this kind is Maskelyne in the "Requisite Tables" and, very curiously, although his directions for computing the Table are correct, the Table as printed is erroneous.

Since then Kerigan, Rosser, Norie, Bergen and Raper have published this error in their various Nautical Tables. I have been able so far to find correct Tables by the following authors, viz., Lax, Inman, Domke, Bowditch, Bagay and Guépratte.

To show the difference between the Tables more clearly I give an example (where the correction for second difference is insensible) worked out by the Tables of Kerigan and Lax respectively.

Ex. :—

Required the Greenwich time of the Moon's Meridian Passage, on July 28, 1882, in longitude 180° W.

	D.	H.	M.		
N.A. Meridian Passage, July	28	10	29·3	58·3 m.	(daily variation or retardation.)
	29	11	27·6		

By Kerigan.				By Lax.			
	D.	H.	M.		D.	H.	M.
Mer. Pass. July	28	10	29·3	July	28	10	29·3
Corrn. for 180° ...			28·0	Corrn. for 180°			29·2
Local Time of Passage		10	57·3			10	58·5
Longitude ...		12				12	
Greenwich Time of Passage	28	22	57·3	July	28	22	58·5

Here we have a difference of 1·2 m. between the two Tables.

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On referring to the Nautical Almanac for this date it may be seen that the result—as computed by Lax's Table—is identical.

THOMAS WRIGHT,

of the Nautical Almanac Office.

3, Verulam Buildings, Gray's Inn.

FAIR TRADE.

To the Editor of the "Nautical Magazine."

SIR,—I shall feel obliged if you will permit me to occupy a small portion of your space for the purpose of replying to one or two of the arguments used in the letter signed "Protectionist," which appeared in the *Nautical Magazine* for July. I must begin, however, by congratulating your correspondent on the thorough-going nature of his belief in the efficacy of State-imposed duties as aids to national prosperity. His views in this respect are quite refreshing when contrasted with those of the half-hearted individuals who profess to believe in Free Trade as long as it is *real* Free Trade, but who have no faith in what they term our present mock system. "Protectionist" boldly asserts his conviction that, under protective principles, England would have been more prosperous "than if Free Trade in its integrity had been in force during the last thirty years." He is fully persuaded that to levy duties on foreign produce is the one safe method of increasing the commercial welfare, and that high prices necessarily result in high profits.

The main drift of "Protectionist's" letter is intended to show the desirability of establishing the grand Customs Confederation of the British Empire of which we have heard a great deal during the last year or two. But, although your correspondent objects to the assumption that the proposed formation of such an union is a chimerical scheme, I notice that he carefully refrains from giving us any clue to the means by which the union is to be established. The fact that several of our colonies have declared commercial war, not only against England, but also against each other, is quietly ignored, and we are merely assured that "to many

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clear-sighted men there is nothing Utopian in the idea." He soars above all details and difficulties and boldly jumps to the desired conclusion. The object "Protectionist" has in view is, I presume to induce the colonies to purchase English manufactured goods, but he does not even suggest how this end is to be gained. To Canada we might, perhaps, offer to impose a duty of 5s. per quarter on all imported foreign corn, but what are we to offer the colony of Victoria to bring about a reversal of its present policy, or what should we offer New Zealand or New South Wales, or the Cape, for example, to induce either of them to remain in the union supposing it had been formed, and supposing the colonists in either case felt inclined to change their minds on the subject. Are we to tax foreign wool, hides, cotton, beef, cheese, and mutton? We have recently had an example in the case of France, of the difficulties which beset the framers of commercial treaties, and from this we can form some idea of the obstacles by which we should find ourselves beset if we had to deal with seven or eight distinct legislative bodies scattered from one end of the world to the other. And even if it were possible to range all these in one harmonious protective system we should then find that we had opened the door to endless frauds upon the revenue. The "clear-sighted men" who see nothing Utopian in the idea of a grand Customs Union ought at least to favour the country with a rough sketch of the details of their plan, in order that those whose vision is more clouded may be able to see their way out of the difficulties by which the scheme appears to them to be surrounded. Let them abstain from those "broad statements" to which "Protectionist" objects as being "not the soundest arguments," and come to details, and when they have enlightened us as to the nature of the proposed method for inducing and maintaining a state of commercial harmony among a number of legislative bodies who are at present pulling in half-a-dozen different directions, we shall then be in a position to understand at least one phase of their proposal.

And now to deal for a moment with the utility of the Confederation scheme. In the school of economists to which "Protectionist" belongs, it is assumed that, in order to retain her commercial pros-

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perity, England must bind herself with her colonies into a Customs Union which shall be self-supporting and independent of all the world besides. Since foreign countries are refusing to deal with England on fair terms it is urged that the entire Empire should keep itself to itself and be prepared to give up all trade with outsiders—that wherever a hostile tariff is raised a counter tariff should be raised in return. But here I would venture to suggest that on the Fair Trader's own showing this system would involve a great deal of unfairness towards some of our colonies. If the fact that the British Empire can be made self-supporting be a valid reason for giving up commercial intercourse with outsiders, surely the same reason would hold good in the case of any colony which could manage to exist on its own resources. If commercial isolation would be advantageous for the whole Empire, would it not also be a benefit for the Australian continent for example? And if commercial isolation would not be an advantage for Australia, why would it be useful to the British Empire? This is a simple question, and I venture to ask "Protectionist" to favour us with a simple answer—not in the form of a "broad statement," but in definite and precise terms. Fair traders appear to take it for granted that there is some kind of mysterious virtue in the boundaries of the British Empire—let them tell us in what this virtue consists. To me it seems that, if the Australian Colonies could derive any commercial advantage from joining the proposed Confederation, it would necessarily follow that the Empire may also derive advantage from trading with foreign nations, and that to hedge itself round with protective duties would not be the best method of increasing its own prosperity. At all events, let "Protectionist" tell us on what ground the distinction is based, and why it is proposed to saddle the Australian Colonies with the task of supporting the trade and commerce of this country. Australia could exist sufficiently well even if all the other continents were submerged; why does "Protectionist" so far desert his principles as to suggest that it should become a member of a great trading Confederation?

In his criticism of the article on *Fair Trade*, which appeared in the *Nautical Magazine* for March, there are many points and

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suggestions to which I should like to refer, but I fear that to do so fully would take me beyond the limits you can allow for the present letter. "Protectionist" takes objection to the statement that England has gained her commercial supremacy by supplying the world with manufactured goods, as being too general in its terms; yet he has the assurance to inform your readers that free trade "would not advance the intellectual development of nations," without giving them even a hint as to the inference they are to draw from this piece of negative information. I assume we are to conclude that protection would assist in this kind of advancement, but, until "Protectionist," favours us with more precise details on the point, I fear I must remain in the dark as to the manner in which this intellectual influence is brought into play. As regards the statement that England has given her colonies the cold shoulder, it seems to me that the facts point in the opposite direction. It is the colonies (at least some of them) which have turned upon England, and are now dealing out to her treatment precisely similar to that she is experiencing from foreign nations, and this without the smallest provocation on her part. With respect to the assumption that the prosperity of England and of the United States is due to the discovery of gold in Australia and California, and that to increase the cost of distribution is to add to the general prosperity, I can only say that if these ideas are sound, it is high time that the study of political economy were commenced afresh. If these views are correct, then the writings of our standard authorities on the subject must be some of the veriest nonsense which has ever been concocted.

I am, Sir, your obedient servant,

THE WRITER OF THE ARTICLE ON "FAIR TRADE."

July 10, 1822.

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TIDE TABLES FOR AUGUST, 1882.

Also Ports of Reference for the Constants in the next Table.

Week Day.	Month Day.	LONDON BRIDGE.		HULL.		NORTH SHIELDS		LEITH.		DEVONPORT.		DOVER.		WESTON-SUPER-MARE.		LIVERPOOL.		GREENOCK.		QUEENSTOWN		KINGSTOWN.		LONDONDERRY.		BREST.	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
		H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
Tu	1	2 49	3 10	7 25	7 48	4 17	4 40	3 [illegible]	3 35	6 41	7 4	—	0 16	7 54	8 16	—	0 20	0 46	1 9	6 1	6 24	—	0 7	8 56	9 17	4 43	5 5
W	2	3 34	3 56	8 10	8 31	5 8	5 25	3 57	4 20	7 26	7 48	0 40	1 4	8 37	8 57	0 42	1 4	1 32	1 54	6 46	7 8	0 30	0 53	9 38	9 59	5 27	5 49
Th	3	4 20	4 41	8 53	9 15	5 48	6 12	4 43	5 7	8 9	8 30	1 28	1 52	9 19	9 40	1 26	1 48	2 16	2 38	7 30	7 52	1 17	1 41	10 20	10 42	6 11	6 34
F	4	5 4	5 26	9 38	10 1	6 36	7 0	5 31	5 53	8 51	9 13	2 16	2 39	9 59	10 18	2 10	2 32	3 0	3 22	8 14	8 36	2 5	2 29	11 6	11 33	6 57	7 20
S	5	5 49	6 11	10 25	10 50	7 24	7 49	6 19	6 45	9 33	9 54	3 2	3 25	10 37	10 57	2 54	3 17	3 44	4 7	8 58	9 21	2 53	3 17	—	0 4	7 44	8 9
Su	6	6 37	7 2	11 19	11 51	8 16	8 48	7 13	7 43	10 17	10 43	3 49	4 14	11 20	11 47	3 42	4 10	4 31	4 57	9 45	10 12	3 43	4 13	0 39	1 16	8 36	9 6
M	7	7 30	8 0	—	0 27	9 24	10 2	8 17	8 54	11 12	11 44	4 40	5 9	—	0 19	4 42	5 19	5 26	5 59	10 43	11 20	4 47	5 23	1 57	2 38	9 40	10 18
Tu	8	8 33	9 11	1 8	1 39	10 41	11 21	9 34	10 14	—	0 21	5 42	6 18	0 55	1 36	6 0	6 44	6 36	7 16	—	noon	6 0	6 37	3 18	3 55	11 0	11 44
W	9	9 55	10 36	2 16	2 55	11 59	—	10 52	11 28	1 2	1 44	6 57	7 38	2 18	3 0	7 26	8 5	7 56	8 36	0 42	1 24	7 14	7 50	4 28	4 59	—	0 24
Th	10	11 16	11 51	3 30	4 4	0 35	1 7	—	0 1	2 24	3 1	8 15	8 46	3 40	4 17	8 39	9 8	9 12	9 43	2 2	2 36	8 24	8 56	5 20	5 50	0 59	1 30
F	11	—	0 24	4 34	4 59	1 35	1 59	0 29	0 53	3 34	4 3	9 14	9 39	4 49	5 17	9 32	9 55	10 11	10 36	3 4	3 30	9 24	9 50	6 13	6 36	1 57	2 21
S	12	0 49	1 14	5 22	5 48	2 21	2 42	1 16	1 38	4 29	4 52	10 8	10 25	5 43	6 7	10 17	10 37	11 0	11 22	3 54	4 16	10 11	10 30	6 58	7 19	2 43	3 2
Su	13	1 35	1 55	6 4	6 24	3 1	3 19	1 58	2 17	5 13	5 32	10 45	11 4	6 28	6 48	10 56	11 14	11 42	—	4 35	4 54	10 47	11 4	7 39	7 57	3 21	3 40
M	14	2 13	2 29	6 43	7 0	3 36	3 52	2 34	2 50	5 50	6 7	11 23	11 42	7 6	7 23	11 31	11 48	0 1	0 19	5 12	5 29	11 20	11 36	8 13	8 28	3 57	4 13
Tu	15	2 48	3 4	7 16	7 32	4 8	4 24	3 5	3 20	6 23	6 39	11 59	—	7 39	7 54	—	0 4	0 36	0 53	5 45	6 1	11 52	—	8 43	8 57	4 29	4 44
W	16	3 18	3 33	7 48	8 3	4 40	4 56	3 35	3 50	6 54	7 8	0 16	0 33	8 9	8 24	0 20	0 36	1 9	1 25	6 17	6 32	0 8	0 24	9 11	9 25	4 59	5 14
Th	17	3 50	4 5	8 18	8 33	5 11	5 27	4 6	4 22	7 22	7 36	0 50	1 7	8 39	8 53	0 51	1 6	1 40	1 55	6 47	7 2	0 40	0 56	9 39	9 53	5 29	5 44
F	18	4 20	4 37	8 48	9 4	5 43	5 59	4 38	4 54	7 50	8 4	1 23	1 39	9 7	9 21	1 21	1 36	2 10	2 25	7 17	7 33	1 12	1 28	10 8	10 23	5 59	6 15
S	19	4 51	5 6	9 20	9 37	6 15	6 32	5 10	5 27	8 18	8 33	1 55	2 12	9 35	9 50	1 51	2 7	2 41	2 57	7 49	8 5	1 44	2 1	10 40	10 58	6 31	6 48
Su	20	5 22	5 37	9 54	10 12	6 50	7 9	5 46	6 6	8 48	9 4	2 30	2 49	10 5	10 20	2 24	2 41	3 13	3 30	8 22	8 39	2 20	2 39	11 20	11 46	7 6	7 26
M	21	5 55	6 17	10 32	10 56	7 30	7 55	6 27	6 50	9 23	9 44	3 8	3 27	10 36	10 57	3 0	3 20	3 49	4 10	8 59	9 22	2 59	3 22	—	0 15	7 48	8 12
Tu	22	6 38	7 2	11 25	11 58	8 23	8 54	7 18	7 49	10 8	10 37	3 50	4 15	11 22	11 51	3 45	4 14	4 34	5 0	9 47	10 15	3 48	4 19	0 48	1 25	8 39	9 10
W	23	7 31	8 2	—	0 33	9 30	10 11	8 24	9 4	11 8	11 45	4 43	5 15	—	0 26	4 49	5 28	5 31	6 6	10 50	11 31	4 54	5 30	2 6	2 48	9 47	10 29
Th	24	8 41	9 24	1 10	1 48	10 52	11 32	9 46	10 26	—	0 28	5 51	6 29	1 5	1 47	6 11	6 57	6 46	7 28	—	0 13	6 9	6 47	3 28	4 4	11 13	11 55
F	25	10 9	10 49	2 27	3 4	—	0 9	11 2	11 36	1 13	1 58	7 9	7 48	2 30	3 11	7 37	8 14	8 8	8 46	0 54	1 34	7 23	7 59	4 35	5 4	—	0 34
S	26	11 28	—	3 39	4 12	0 43	1 14	—	0 7	2 38	3 17	8 24	8 54	3 51	4 27	8 46	9 14	9 21	9 51	2 12	2 45	8 33	9 4	5 30	5 55	1 8	1 37
Su	27	0 2	0 29	4 41	5 5	1 41	2 5	0 34	0 59	3 49	4 17	9 22	9 48	5 0	5 29	9 39	10 3	10 19	10 45	3 13	3 40	9 32	9 58	6 20	6 44	2 4	2 29
M	28	0 54	1 19	5 29	5 53	2 28	2 50	1 23	1 47	4 44	5 9	10 14	10 39	5 56	6 22	10 27	10 50	11 11	11 36	4 5	4 29	10 20	10 42	7 8	7 32	2 52	3 15
Tu	29	1 43	2 4	6 17	6 41	3 12	3 34	2 10	2 32	5 34	5 58	11 4	11 29	6 46	7 10	11 13	11 36	—	noon	4 53	5 17	11 4	11 25	7 55	8 17	3 38	4 1
W	30	2 28	2 50	7 4	7 27	3 56	4 18	2 54	3 15	6 22	6 46	11 53	—	7 33	7 55	11 59	--	0 24	0 47	5 40	6 2	11 47	—	8 37	8 57	4 23	4 44
Th	31	3 12	3 35	7 49	8 10	4 40	5 2	3 36	3 57	7 8	7 28	0 17	0 41	8 16	8 36	0 21	0 43	1 10	1 32	6 24	6 46	0 9	0 31	9 17	9 37	5 5	5 26

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TIDAL CONSTANTS

For Various British, Irish, and European Ports.

By applying the Tidal Constant of the place, according to its sign (+ *add* — *sub.*), to the time of high water on the given day at the port of reference, you have the time of high water at the place sought.

Place.	Constant.	Port of Reference.
	H. M.	
Aberdeen	−1 17	Leith
Aberystwyth	−3 52	Liverpool
Alderney	+2 59	Brest
Antwerp	+5 13	Dover
Arbroath	−0 42	Leith
Arcachon	+0 50	Brest
Arklow	−2 25	Kingstown
Ayr	−0 18	Greenock
Banff	−1 49	Leith
Bantry harbour	−1 14	Queenstown
Barnstaple bridge	−0 26	Weston-s.-Mare
Bayonne	−0 2	Brest
Beachy head & Rye bay	+0 8	Dover
Beaumaris	−0 51	Liverpool
Belfast	+2 42	Londonderry
Berwick	−1 5	N. Shields
Blyth	−0 8	N. Shields
Bordeaux	+3 3	Brest
Boulogne	+0 13	Dover
Bridport	+0 22	Devonport
Bristol & King Road	+0 19	Weston-s.-Mare
Cadiz	−2 2	Brest
Caernarvon	−1 56	Liverpool
Calais	+0 37	Dover
Campbellton	−0 23	Greenock
Cardiff	+0 2	Weston-s.-Mare
Cardigan bar	−4 22	Liverpool
Carlingford bar	−0 10	Kingstown
Chatham	−0 47	London
Cherbourg	+4 2	Brest
Coleraine	−1 37	Londonderry
Coquet Road	−0 23	N. Shields
Cordouan Tower	−0 10	Brest
Cowes (West)	−0 27	Dover
Crinan	+4 41	Greenock
Cromarty	−2 21	Leith
Dartmouth	+0 33	Devonport
Deal & Downs	+0 3	Dover
Dieppe	+7 19	Brest
Donaghadee	+0 3	Kingstown
Donegal harbour	+0 17	Queenstown
Douglas & Ramsay	−0 11	Liverpool
Dublin bar	+0 2	Kingstown
Dundalk	−0 16	Kingstown
Dungeness	−0 27	Dover
Dunkerque	+0 56	Dover
Exmouth	+0 38	Devonport
Falmouth	−0 46	Devonport
Fecamp	+6 57	Brest
Ferrol	−0 47	Brest
Flamborough head	−1 59	Hull
Fleetwood	−0 12	Liverpool
Folkestone	−0 5	Dover
Fowey	−0 29	Devonport
Flushing	+1 42	Dover
Galway bay	−0 26	Queenstown
Gibraltar	−1 27	Brest
Glasgow (Port)	+0 10	Greenock
Gloucester	+2 51	Weston-s.-Mare
Granville	+0 26	Brest
Gravesend	−0 48	London
Grimsby (Great)	−0 53	Hull
Guernsey (St. Peter)	+2 50	Brest
Hartlepool	+0 5	N. Shields
Harwich	−1 52	London
Havre	+6 4	Brest
Helgoland	+0 21	Dover
Holyhead	−1 12	Liverpool
Holy Island harbour	−0 53	N. Shields
Honfleur	+5 42	Brest
Inverness	−1 59	Leith

Place.	Constant.	Port of Reference.
	H. M.	
Jersey (St. Helier)	+2 38	Brest
Kinsale	−0 18	Queenstown
Lerwick (Shetland)	−3 47	Leith
Limerick	+1 15	Queenstown
Lisbon Bar	−1 17	Brest
Littlehampton	+0 24	Dover
Llanelly bar	−0 38	Weston-s.-Mare
Lowestoft	−4 1	London
Lynn & Boston Deep	−0 29	Hull
Margate	−2 18	London
Maryport	+0 3	Liverpool
Milford Haven entr.	−0 58	Weston-s.-Mare
Montrose	−0 52	Leith
Morlaix	+1 6	Brest
Needles point	−1 26	Dover
Newcastle	+0 23	N. Shields
Newhaven	+0 39	Dover
Newport	+0 16	Weston-s.-Mare
Nieuport	+1 6	Dover
Nore	−1 28	London
Orfordness	−2 43	London
Oporto	−1 17	Brest
Ostende	+1 18	Dover
Padstow	−1 41	Weston-s.-Mare
Peel, Isle of Man	−0 15	Liverpool
Pembroke Dock	−0 42	Weston-s.-Mare
Penzance	−1 18	Devonport
Peterhead	−1 43	Leith
Piel harbour, Barrow	−0 18	Liverpool
Plymouth breakwater	−0 6	Devonport
Poole	−2 2	Dover
Port Carlisle	+0 47	Liverpool
Portland breakwater	+1 18	Devonport
Port Patrick	−0 58	Greenock
Portsmouth	+0 29	Dover
Ramsgate	−2 19	London
Rotterdam	+4 33	Dover
Santander	−0 17	Brest
Scarborough	+0 48	N. Shields
Selsea bill	+0 33	Dover
Sheerness	−1 21	London
Shoreham	+0 22	Dover
Sligo bay	+0 17	Queenstown
Southampton	−0 42	Dover
Spurn point	−1 3	Hull
St. Ives	−2 10	Weston-s.-Mare
St. Malo	+2 18	Brest
St. Mary (Scilly)	−1 16	Devonport
St. Nazaire	−0 7	Brest
Stornoway	+6 38	Greenock
Stromness (Orkneys)	−5 17	Leith
Sunderland	−0 1	N. Shields
Swansea bay	−0 53	Weston-s.-Mare
Tay bar	−0 11	Leith
Tees bar	+0 22	N. Shields
Tenby	−1 12	Weston-s.-Mare
Thurso	−5 49	Leith
Torbay	+0 17	Devonport
Tralee bay	−0 58	Queenstown
Ushant (Ouessant)	−0 15	Brest
Valentia harbour	−1 19	Queenstown
Waterford	+0 19	Queenstown
Westport	−0 4	Queenstown
Wexford	+2 20	Queenstown
Whitby	+0 22	N. Shields
Whitehaven	−0 9	Liverpool
Wick	−2 55	Leith
Wicklow	−0 41	Kingstown
Workington	−0 19	Liverpool
Yarmouth road	−4 43	London
Youghall	+0 13	Queenstown

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MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
252	England—South Coast—Isle of Wight	Prohibited anchorages.
253	„ „ Southampton Water —Calshot Spit	Buoy to be replaced by light-vessel.
254	„ East Coast—Humber River—Winteringham Haven	Additional leading lights.
255	„ West Coast—Whitehaven	Fog-signal on West pier head.
256	Scotland—West Coast—Campbeltown Loch—Otterard Rock	New buoy.
257	Ireland—East Coast—Codling Bank Light-vessel	Fog-signal established.
258	„ „ Lough Carlingford	Proposed alteration in buoyage.
259	„ „ Liffey River Entrance	New occulting light.
260	North Sea—Hook of Holland Canal	Buoy lighted by gas at entrance.
261	Baltic—Aland Islands—West Bogskär	Intended light.
262	„ Finland—Sidby Fiärd—Harr grund	New fishing light.
263	„ Gulf of Bothnia—Sydostbrötten Light-vessel	Intended alteration in fog-signal.
264	France—North Coast—Calais	Alterations in tidal signals.
265	„ West Coast—Baleines, Ile de Ré	Temporary light; intended electric light.
266	„ „ La Vilane River	New leading lights; alteration in old light.
267	Spain—North Coast—Santona Harbour	New buoy.
268	Mediterranean—Gulf of Salerno—Salerno	Works in progress, intended harbour light.
269	„ Adriatic—Gulf of Quarnero—Melada Island—Port Lucina	New leading light.
270	„ Adriatic—Dalmatia —Port Spalato	Particulars of mole head light.
271	„ Egypt—Alexandria	Eunostos point light not in working order.
272	„ Dardanelles—Nagara and Gallipoli	Alteration in lights.
273	Black Sea—Tuslinski Light-vessel	Replaced in position.
274	„ Gulf o Asov—Petchany Light-vessel	New fog-signal.
275	„ Batoum	Alteration in lights.
276	India—West Coast—Karwar	Karwar Rock buoy adrift.
277	„ Bay of Bengal—Pulicat	Alteration of colour of lighthouse.
278	Eastern Archipelago—Sourabaya Strait	Light-ship withdrawn; leading lights established.
279	China Sea—Borneo—Malludu Bay	Shoal discovered.
280	„ „ North-East Coast	Sunken rocks discovered.
281	China—East Coast—Breaker Point and Good Hope Cape Lighthouses	Fog-signals established.
282	Japan—Kiusiu—Nelly Rocks	Position established.
283	„ Nipon—Yeddo Gulf—Yokohama Bay	Fog-signal at light-vessel.
284	„ Yezo Island—Hakodate	Fog-signal at light-vessel.

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MONTHLY ABSTRACT OF NAUTICAL NOTICES—*Continued.*

No.	PLACE.	SUBJECT.
285	AUSTRALIA—North East Coast—Margaret Bay	Sand bank reported.
286	NEW ZEALAND—Middle Island—Timaru	Alteration in pricipal light.
287	„ Foveaux Strait	Discovery of shoal.
288	UNITED STATES—California—San Francisco	Wreck on the bar.
289	WEST INDIES—New Granada — Zamba Island	Disappearance of the island.
290	„ Puerto Rico—Cape Rojo	New light.

NAUTICAL NOTICES.

All Bearings Magnetic, unless otherwise stated.

252.—ENGLAND.—*South Coast.—Isle of Wight—Prohibited Anchorages.*—Vessels are prohibited from anchoring within a certain space extending from the north end of Ryde pier; and also within a certain space in Cowes road and harbour, as follows:—

(1.) RYDE.—PROHIBITED ANCHORAGE.—The space within which vessels are prohibited from anchoring off the north end of Ryde pier, is defined in the following manner:—On the north—by lines joining four buoys, numbered respectively (commencing from the eastward) 6, 1, 2, 4. On the south—by lines joining respectively the N.E. and N.W. extremities of Ryde pier, with buoys numbered 5, 3. *Buoy* No. 1—*can, chequered red and white*—is moored in 2¼ fathoms, 600 feet N.E. ½ N. from angle of pier under the green light on the pier head. *Buoy* No. 2—*can, red*—is moored in 2¼ fathoms, 600 feet N.N.W. ½ W. from the angle of pier under the white light on pier head. *Buoy* No. 3—*can, chequered red and white*—is moored in 2½ fathoms, 2,000 feet N.W. from the inner west corner of pier head, with Spit fort bearing E. by N. ¼ N., and Trinity church spire, Ryde, S. by E. *Buoy* No. 4—*can, red*—is moored in 3¼ fathoms, 300 feet N.E. from buoy No. 3. *Buoy* No. 5—*red with bell*—is moored in 4¾ fathoms, 2,000 feet E. by N. ½ N. from the eastern inner corner of pier

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head, with Trinity church spire, Ryde, bearing S.W. by S., and Osborne north tower, N.W. by W. ¾ W. *Buoy* No. 6—*can, chequered red and white*—is moored in 4 fathoms, 400 feet N. by W. ¼ W. from buoy No. 5.

(2.) COWES ROAD AND HARBOUR.—PROHIBITED ANCHORAGE.—The space within which vessels are prohibited from anchoring in Cowes road and harbour, is defined in the following manner:—On the east—by lines joining four chequered buoys, numbered respectively (commencing from the northward) 1, 3, 5, 7; and farther by a line joining buoy No. 7 with the northern end of Trinity pier, East Cowes. On the west—by lines joining four red buoys, numbered respectively (commencing from the northward) 2, 4, 6, 8; and farther by a line joining buoy No. 8 with the buoy (to be coloured *red*) north-eastward of Thetis dock, West Cowes. *Buoy* No. 1—*red and white chequered with cage*—is moored in 10 fathoms, 1,310 feet W. by N. ¼ N. from Prince Consort buoy, with east extreme of Royal Yacht Club house in line with St. Mary's church tower, West Cowes, bearing S.W. by S., and Notice board on Shrape mud, S. by E. ¼ E. *Buoy* No 2—*can, red*—is moored in 8¼ fathoms, 800 feet W. by N. ½ N. from buoy No. 1., with east extreme of Trinity church, West Cowes, in line with St. Mary's church tower, bearing S. by W. ¾ W., and Notice board on Shrape mud, S.S.E. ¼ E. (nearly). *Buoy* No. 3—*can, red and white chequered*—is moored in 10 feet, with the north flagstaff on West Cowes parade in line with the west end of the chapel, bearing S.W. ½ S., and Notice board on Sbrape mud, S.E. ¾ S. *Buoy* No. 4—*can, red*—is moored in 7 feet, 310 feet W. by N. ¼ N. from buoy No. 3, with outer face of pontoon at Fountain pier, bearing S. ¼ E. (nearly) and east extreme of Royal Yacht club house in line with east extreme of Trinity church, W. by S. *Buoy* No. 5—*can, red and white chequered*—is moored in 8 feet, with north-east angle of Fountain pier in line with flagstaff, bearing W. by S. ¼ S., and north flagstaff on West Cowes parade, N.N.W. ¼ W. *Buoy* No. 6—*can, red*—is moored in 6 feet, with east end of Medina Commercial pier in line with Thetis tower, bearing S. ¼ E., and north flagstaff on west Cowes parade in line with N.E. extreme of Marine parade N.W. by N. *Buoy* No. 7—*can, red and white chequered*—

is moored in 9 feet, with north end of East Cowes barracks in line with the south end of Slatwoods, bearing, S.E. by E. ½ E., and Thetis flagstaff in line with east extreme of Thetis dock, S. by W. *Buoy* No. 8—*can, red*—is moored in 6 feet, with Notice board on Shrape mud in line with tower on sea wall at east Cowes, bearing east, and east end of Medina Commercial pier in line with Thetis tower, S. ¼ E.

Note.—Middle buoy (black) between two buoys Nos. 5, 7 is removed. All depths are given at low water spring tide. *Variation*, 18¾° *W.*

253.—ENGLAND.—*South Coast.—Southampton Water Entrance. —Calshot Spit Buoy to be replaced by Light-Vessel.*—It is intended to remove the refuge bell buoy on the south-eastern extremity of Calshot spit, western side of entrance to Southampton water; and in place thereof to moor a light-vessel, from which will be exhibited a *red* light above a *white* light, 12 feet apart from each other. Further notice will be given when the lights are exhibited.

254.—ENGLAND.—*East Coast.—Humber River.—Winteringham Haven.—Additional Leading Lights.*—In consequence of an alteration in the channel round Whitton ness, two additional leading lights are to be exhibited on the S.E. side of Winteringham haven, south shore of Humber river.

Note.—The two lights on the shore at Winteringham will be continued as at present.

255.—ENGLAND.—*West Coast.—Whitehaven.—Fog-Signal on West Pier Head.*—A steam fog whistle has been recently established on the west pier head at Whitehaven, for the purpose of guiding vessels into that harbour during thick or foggy weather. This fog whistle will give blasts of *five seconds'* duration every *half minute.*

256.—SCOTLAND.—*West Coast.—Entrance to Campbeltown Loch, Sound of Kilbrennan.—Otterard Rock Buoy.*—A 10-foot buoy now marks the Otterard rock, situated a little to the eastward of the entrance to Campbeltown loch, sound of Kilbrennan. The buoy is chequered red and black, with black mast and cage, and is moored on the S.W. tail of rock, in 7 fathoms at low

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water spring tides. The marks and bearings from the buoy are as follow, viz.—Devaar lighthouse, S.W. ½ W.,; Heath house, near Glenramskill old distillery, a little open to the S.W. of Millmore black beacon, S.W. by W. ½ W.; remarkable notch on distant hill halfway between Smerby farm house and old ruins, W.N.W. ½ N.

257.—IRELAND.—*East Coast.—Fog-Signal at Codling Bank Light-Vessel.*—A fog-signal has been established at the Codling bank light-vessel. It is a powerful siren trumpet, giving *three blasts* every *two minutes*, arranged as follows:—Blast of 2 seconds' duration; interval of 5 seconds' duration. Blast of 2 seconds' duration; interval of 5 seconds' duration. Blast of 2 seconds' duration; interval of 104 seconds' duration.

258.—IRELAND.—*East Coast.—Lough Carlingford.—Intended Alteration in Buoyage.*—On the 1st October, 1882, the following alterations will be made. The eastern side of the channel will be marked by can buoys painted red, and the western side by nun buoys painted black; so that vessels entering Lough Carlingford should leave the red buoys on the starboard-hand, and the black buoys on the port-hand,

259.—IRELAND.—*East Coast.—Liffey River Entrance.—Occulting Light North Side of Channel.*—With reference to previous Notice, No. 188, p. 472, on the intended exhibition of a light from beacon lighthouse, No. 1, on the northern side of the channel, Liffey river; this light is now exhibited. It is an *occulting white* light, showing a *flash every three seconds*, elevated 49 feet above high water. The lighthouse is situated about 1⅓ mile within the entrance, and about 500 yards westward of No. 5 beacon.

260. NORTH SEA.—*Hook of Holland Canal.—Buoy Lighted by Gas at Entrance.*—On or soon after, 10th June, 1882, a buoy lighted by gas would be moored a little seaward of black buoy A (withdrawn), at the entrance to the Hook of Holland canal, with the north pier head bearing E.S.E., distant 6 cables: it is a *fixed white* light. This gas buoy (Herbert's second class) will serve as the outer buoy of the West gat; it is coloured black, and marked *Waterweg A, Rotterdam*, in white letters.

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261.—BALTIC.—*Aland Islands.—Intended flashing light on West Bogskär.*—With reference to Notice in 1881, on the intended exhibition of a light from a lighthouse then in course of construction on the western Bogskär rock, southern approach to Aland islands; the lighthouse is being constructed (of iron) on the western rock of the Bogskär (Bokeher) group, and is expected to be completed during the autumn of 1882. The light will be a *flashing* white light, showing *four white flashes every minute*, each flash being of about *fifteen seconds'* duration. Position, lat. 59° 30′ 15″ N., long. 20° 21′ 15″ E. Further particulars in due course.

262.—BALTIC.—*Finland.—Sidby Fiärd.—Fishing Light on Harr Grund.*—On August 10, 1882, a fishing light will be exhibited from a pole on Harr grund, Sidby (Sideby) fiärd entrance; it will be a *fixed white* light, elevated 20 feet above the sea. Position, lat. 61° 59′ 15″ N., long. 21° 17′ 30″ E. The light will be shown from August 10, until October 1.

263.—BALTIC.—*Gulf of Bothnia.—Sweden.—Sydostbrotten light-vessel.—Intended Alteration in Fog-Signal.*—During thick or foggy weather, the signal (steam horn) will give *four or five* short regular blasts *every minute*.

264.—FRANCE.—*North Coast.—Alterations in Tidal Signals at Calais.*—On and after 15th July, 1882, the following alterations would be made in the tidal signals at Calais: these lights will be exhibited from the top of an iron tower, 19 feet high, painted white, and situated at the outer extremity of the eastern pier of Calais harbour. These lights are elevated 27 feet above high water, and visible from a distance of 9 miles. The depths above low water will be indicated by these lights, as follows: A *fixed red* light will indicate less than 6½ feet, but tide rising. A *fixed green* light will indicate less than 6½ feet, but tide falling. A *fixed white* light will indicate depths of from 6½ to 7½ feet. A *fixed white* light varied by groups of *red* and *green flashes*, will indicate depths of more than 7½ feet.

Note.—The groups of flashes will be separated by intervals of *five minutes*, and the flashes in each group by intervals of *eighty seconds*; each *red* flash will indicate an additional rise of 3½ feet.

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and each *green* flash an additional rise of three-quarters of a foot. While the tide is rising the fixed light (of each colour) will be eclipsed for a short interval every *eighty seconds*, and when the tide is falling, it will be eclipsed *twice* in quick succession every *eighty seconds*; these eclipses will occur nearly in the middle of the intervals separating *groups* of flashes. No eclipse will take place at or about high water. On the same date on which the above night signals will be exhibited, the day tidal signals will be shown when there is a depth of more than 6¼ feet in the channel, and will indicate whether the tide is rising or falling, and also, changes of three-quarters of a foot in the depth.

265. — FRANCE. — *West Coast.* — *Intended Electric Light at Baleines, Ile de Ré, and present Exhibition of Temporary Light.*— In the course of the present year (probably October), an electric light will be exhibited from the light tower at Baleines, on the N.W. extreme of Ile de Ré; it will be a *white flashing* light, showing a succession of groups of *four white flashes*, the interval between two successive groups being three times as long as that between successive flashes of the same group. Further notice will be given of the exact date when this new light will be exhibited. The works in connection with this electric light would commence about the end of June, when the present light would be discontinued, and a *temporary* light of the same character (*revolving* every thirty seconds) be exhibited from the old Baleines lighthouse, situated 90 yards N.W. ¾ N. from the lighthouse now used. This *temporary* light will be elevated 92 feet above high water, and be visible from a distance of 16 miles; in ordinary weather the eclipses will not appear total when within a distance of 8 miles from it; also, this light will be visible from all directions, except over an arc of 62°, between the bearings of N. 15° W. and N. 77° W. *Variation*, 18° *W.*

266.—FRANCE.—*West Coast.*—(1.) *Leading Lights at Entrance to La Vilaine River.*—Two leading lights have been established on the left bank of La Vilaine river, near Trehiguier, and are exhibited from square towers of masonry, recently constructed. The *western* light is *fixed white*, elevated 25 feet above high water, and visible from a distance of 9 miles; it is situated on the

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MONTHLY ABSTRACT OF NAUTICAL NOTICES—*Continued.*

No.	PLACE.	SUBJECT.
285	AUSTRALIA—North East Coast—Margaret Bay	Sand bank reported.
286	NEW ZEALAND—Middle Island—Timaru	Alteration in pricipal light.
287	„ Foveaux Strait	Discovery of shoal.
288	UNITED STATES—California—San Francisco	Wreck on the bar.
289	WEST INDIES—New Granada — Zamba Island	Disappearance of the island.
290	„ Puerto Rico—Cape Rojo	New light.

NAUTICAL NOTICES.

All Bearings Magnetic, unless otherwise stated.

252.—ENGLAND.—*South Coast.—Isle of Wight—Prohibited Anchorages.*—Vessels are prohibited from anchoring within a certain space extending from the north end of Ryde pier; and also within a certain space in Cowes road and harbour, as follows :—

(1.) RYDE.—PROHIBITED ANCHORAGE.—The space within which vessels are prohibited from anchoring off the north end of Ryde pier, is defined in the following manner :—On the north—by lines joining four buoys, numbered respectively (commencing from the eastward) 6, 1, 2, 4. On the south—by lines joining respectively the N.E. and N.W. extremities of Ryde pier, with buoys numbered 5, 3. *Buoy* No. 1—*can, chequered red and white*—is moored in 2¼ fathoms, 600 feet N.E. ¼ N. from angle of pier under the green light on the pier head. *Buoy* No. 2—*can, red*—is moored in 2¼ fathoms, 600 feet N.N.W. ½ W. from the angle of pier under the white light on pier head. *Buoy* No. 3—*can, chequered red and white*—is moored in 2¼ fathoms, 2,000 feet N.W. from the inner west corner of pier head, with Spit fort bearing E. by N. ¼ N., and Trinity church spire, Ryde, S. by E. *Buoy* No. 4—*can, red*—is moored in 3¼ fathoms, 300 feet N.E. from buoy No. 3. *Buoy* No. 5—*red with bell*—is moored in 4¼ fathoms, 2,000 feet E. by N. ¼ N. from the eastern inner corner of pier

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head, with Trinity church spire, Ryde, bearing S.W. by S., and Osborne north tower, N.W. by W. ½ W. *Buoy* No. 6—*can, chequered red and white*—is moored in 4 fathoms, 400 feet N. by W. ½ W. from buoy No. 5.

(2.) COWES ROAD AND HARBOUR.—PROHIBITED ANCHORAGE.—The space within which vessels are prohibited from anchoring in Cowes road and harbour, is defined in the following manner:—On the east—by lines joining four chequered buoys, numbered respectively (commencing from the northward) 1, 3, 5, 7; and farther by a line joining buoy No. 7 with the northern end of Trinity pier, East Cowes. On the west—by lines joining four red buoys, numbered respectively (commencing from the northward) 2, 4, 6, 8; and farther by a line joining buoy No. 8 with the buoy (to be coloured *red*) north-eastward of Thetis dock, West Cowes. *Buoy* No. 1—*red and white chequered with cage*—is moored in 10 fathoms, 1,310 feet W. by N. ½ N. from Prince Consort buoy, with east extreme of Royal Yacht Club house in line with St. Mary's church tower, West Cowes, bearing S.W. by S., and Notice board on Shrape mud, S. by E. ½ E. *Buoy* No 2—*can, red*—is moored in 8¼ fathoms, 800 feet W. by N. ½ N. from buoy No. 1., with east extreme of Trinity church, West Cowes, in line with St. Mary's church tower, bearing S. by W. ¾ W., and Notice board on Shrape mud, S.S.E. ½ E. (nearly). *Buoy* No. 3—*can, red and white chequered*—is moored in 10 feet, with the north flagstaff on West Cowes parade in line with the west end of the chapel, bearing S.W. ½ S., and Notice board on Shrape mud, S.E. ¾ S. *Buoy* No. 4—*can, red*—is moored in 7 feet, 310 feet W. by N. ½ N. from buoy No. 3, with outer face of pontoon at Fountain pier, bearing S. ½ E. (nearly) and east extreme of Royal Yacht club house in line with east extreme of Trinity church, W. by S. *Buoy* No. 5—*can, red and white chequered*—is moored in 8 feet, with north-east angle of Fountain pier in line with flagstaff, bearing W. by S. ½ S., and north flagstaff on West Cowes parade, N.N.W. ½ W. *Buoy* No. 6—*can, red*—is moored in 6 feet, with east end of Medina Commercial pier in line with Thetis tower, bearing S. ½ E., and north flagstaff on west Cowes parade in line with N.E. extreme of Marine parade N.W. by N. *Buoy* No. 7—*can, red and white chequered*—

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extremity of Seal point. Position as given, lat. 47° 29′ 40″ N., long. 2° 27′ 0″ W. The *eastern* light is *fixed red*, situated 480 yards distant from the western light; it is elevated 68 feet above high water, and visible from a distance of 9 miles. These lights are in line when bearing S. 49° E., and indicate the course to be pursued; the eastern light is only visible over an arc of 28 degrees, or from S. 35° E. to S. 63° E.

(2.) *Alteration in Character of Penlan Point Light.*—The present light shown at Penlan point, entrance of La Vilaine river, will be discontinued, and replaced by a light exhibited from the top of a square tower, constructed of masonry, standing close to the former light tower. It will be a *fixed* light, showing *red* seaward between the bearings of N. 19° E. and N. 71° E., and *white* between the bearings of N. 71° E. and S. 71° E.: elevation 68 feet above high water; the white sector visible from a distance of 13 miles, and the red sector from a distance of 9 miles.

Note.—By keeping within the sector of *white* light, vessels will avoid the shoal of La Grande Accroche. *Variation*, 19° *W.*

267.—SPAIN.—*North Coast.—Santona Harbour.—Buoy.*—The outer edge of Pitorro bank, in the harbour of Santona, is now marked by a red nun buoy.

268.—MEDITERRANEAN.—*Gulf of Salerno.—Salerno.—Works in Progress, intended Harbour Light.*—From the eastern extremity of the existing breakwater (which extends about 350 yards in a N. 77° E. and S. 77° W. direction), the new Eastern mole will commence—extending first towards S. 35° E. for a distance of 219 yards, and thence S. 60° E. for 164 yards. On the extremity of this Eastern mole, a light will be exhibited. From the western extremity of the existing breakwater the new Western mole, which is to close the harbour to the westward, will commence—it will first extend in a curve for 109 yards, then N. 12° W. for 328 yards, and thence with a wide curve in a N. 11° E. direction for 175 yards to the shore. The old mole (Manfredi) will be converted into a wharf, being widened its entire length, about 65 yards. The entrance of the port, between Manfredi mole and the existing breakwater, on the completion of the works, will be 132 yards wide—and will have a depth of 3¼ to 3¾ fathoms.

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Note.—In the course of the year 1882, the western entrance will be reduced in width from 600 yards to 437 yards; and the eastern entrance will be improved, by removing the foundation of the old breakwater situated between Manfredi mole and the existing breakwater. *Variation*, 10½° *W.*

269.—MEDITERRANEAN.—*Adriatic.—Gulf of Quarnero.—Melada Island.—Leading Light at Port Lucina.*—A leading light is now exhibited at port Lucina (di Melada), indicating the channel into Berguglie bay, between Bonaster point and Bacili islets; it is a *fixed white* light, visible through an arc of 7°, or between the bearings of N. 60° E. (this bearing leads about 1¼ cable north-west of Bacili outer islet) and N. 67° E. (leading one cable south-east of Bonaster point); it is elevated 29 feet above high water (16 feet above the ground), and is visible from a distance of 8 miles. The light is shown from the only window looking westward, in the solitary house situated at the south-east part of the port, 31 yards from the shore; the side of the house is painted white. Position approximate, lat. 44° 12′ 45″ N., long. 14° 52′ 30″ E.

Note.—This light in sight leads clear of Bonaster point and Bacili islets; but leads over Bonaster rock (depth 3 fathoms). Berguglie bay is a place of refuge for vessels of light draught only. *Variation*, 10° *W.*

270.—MEDITERRANEAN.—*Adriatic.—Dalmatia.—Port Spalato.—Particulars of Mole Head Light.*—Also, with reference to previous Notice, No. 59, p. 143, on the exhibition of a new light from an iron tower at the extremity of the mole, port Spalato; the light (fixed and flashing) is elevated 34 feet above high water, and is visible through an arc of 328°, or between the bearings of N. 65½° W. and S. 82½° W.—this arc is broken by a sector of *red* light shown towards San Stefano point between the bearings of N. 79½° E. and S. 62½° E. *Variation*, 9½° *W.*

271.—MEDITERRANEAN.—*Egypt—Alexandria Light.*—Mariners are cautioned that Alexandria light (Eunostos point) is not in working order.

272.—MEDITERRANEAN.—*Dardanelles.*—(1.) *Alteration in Nagara Light.*—The following alteration has been made; it is a *revolving*

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red light, attaining its greatest brilliancy every *fifteen seconds*, and visible from a distance of 12 miles. The eclipses of the light are total.

(2.) *Alteration in Gallipoli Light.*—The period of revolution of Gallipoli light (*white*) is every *minute*, instead of every half minute as heretofore.

273.—Black Sea.—*Tuslinski Light-Vessel Replaced in Position.*—With reference to Notice No. 194, p. 475, Tuslinski light-vessel has been repaired and replaced in position.

274.—Black Sea.—*Gulf of Asov.—Fog-Signal at Petchany Light-Vessel.*—This fog-signal consists of a steam whistle, giving blasts of *four seconds'* duration, separated by intervals of *twenty-two seconds'* duration.

Note.—In the event of this whistle becoming damaged, the fog-bell will be sounded as heretofore.

275.—Black Sea.—*Alteration in Batoum Lights.*—The two fixed lights heretofore exhibited on the western side of Batoum bay have been discontinued, and in their place, one fixed light is now exhibited, elevated 49 feet, and visible from a distance of 8 miles.

276.—India.—*West Coast—Karwar or Sadashivgad.—Breaking adrift of Karwar Rock Buoy.*—The buoy marking the Karwar rock (Gudsar sunv.), lying to the W.N.W. of Elephant island, has broken adrift and sunk. It will be impracticable to replace it during the present monsoon.

277.—India—*Bay of Bengal.—Coromandel Coast.—Pulicat.—Alteration of Colour of Lighthouse.*—Now painted in white and black bands, instead of all white, as formerly.

278.—Eastern Archipelago.—*Sourabaya Strait.—Madura Island.—Exhibition of Leading Lights; Withdrawal of Sourabaya Light-Vessel.*—With reference to Notice in 1879, the leading lights are exhibited; and the light-vessel is to be withdrawn; the southern light is a *fixed white* light, elevated 177 feet above high water, and visible from a distance of 19 miles. The lighthouse (the top of which is seen above the trees), is 164 feet high, constructed of iron, painted white, and is situated at Sembilangan, near Slimpil point. Position as given, lat. 7° 3′ 50″ S., long. 112° 40′ 20″ E. The northern light is a *fixed white* light, elevated 52 feet above

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high water, and visible from a distance of 10 miles. The light-house, constructed of iron framework and painted white, is situated on cape Piering (Piring), N.W. extreme of Madura island. Position as given, lat. 7° 2′ 20″ S., long. 112° 40′ 50″ E. These lights in line bearing S. by W. ½ W. lead through the fair-way, on the western side (marked by white buoys) of the eastern buoyed channel.

279.—China Sea.—*Borneo.—North Coast.—Malludu Bay.—Shoal in Koudat Bay Entrance.*—Lying in the fairway of the entrance to Koudat bay, west side of Malludu bay; this shoal extends about 150 yards in an east and west direction by about 50 yards in breadth, with a least depth of one fathom over it, and lies with the following bearings and distance:—South extreme of Hummock, S. 88° W.; second point, N. 14° W., distant $1\frac{3}{10}$ths mile.

Note.—Vessels should pass southward of this shoal—north-eastward of it lies Witt rock, with a channel between about one cable wide and a depth of 7 fathoms.

280.—China Sea.—*Borneo.—N.E. Coast.*—(1.) *Sunken Rock Eastward of Marantabuan Islet.*—Lying about 1½ mile E. by S. of Marantabuan islet, eastern approach to Mallawallé channel; this danger (*Mosquito rock*) was seen from the masthead about 1½ cable on the starboard-bow, as the *Mosquito*, steering a W.S.W. course, was passing north-eastward of Tibakkan islet. By subsequent boat examination, Mosquito rock was found to be circular in shape, about one cable in diameter, with a least depth on it of 3 feet, and steep-to around; it lies with the following bearings:—Tibakken islet, S.W. ½ S.; Marantabuan islet, W. by N. ¼ N. These bearings place Mosquito rock in lat. 6° 56′ 50″ N., long. 117° 30′ 50″ E.

Note.—Mosquito rock is only discernible from the masthead at a short distance.

(2.) *Sunken Rock Northward of Billebillean Rock.*—Lying about 2¼ miles N.N.E. of Billebillean rock, eastern approach to Mallawallé channel; this danger (*Lily rock*), which the *Lily*, drawing 18½ feet, grazed over, is apparently steep-to on the S.E. side, with 7 to 8 fathoms close-to on the N.W. side; it lies with

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the following bearings:—Lankayan island (very indistinct), S. 41° E.; Billebillean rock, S. 22° W. These bearings place Lily rock in approximately, lat. 6° 36′ 50″ N., long. 117° 49′ 40″ E.

Note.—It is estimated that the depth over Lily rock is about 9 feet.

281.—CHINA.—*East Coast.*—(1.) *Fog-Signal at Breaker Point Lighthouse.*—When, during foggy weather, a bell, fog horn, steam whistle, or other sound, is heard indicating the proximity of a vessel—two guns will be fired with an interval of *ten seconds;* and if the vessel's fog-signal continues to be heard, the firing will be repeated after an interval of *ten minutes.*

(2.) *Fog-Signal at Good Hope Cape Lighthouse.*—When, during foggy weather, a bell, fog horn, steam whistle, or other sound, is heard indicating the proximity of a vessel—two guns will be fired with an interval of *one minute;* and if the vessel's fog-signal continues to be heard, the firing will be repeated after an interval of *fifteen minutes.*

282.—JAPAN.—*Kiusiu.—East Coast.—Position of Nelly Rocks.*—Nelly rocks (locally known as Odono-se) consist of several rocks having over them depths of from one to three fathoms, and extending three-quarters of a mile in a north and south direction; the central part of this cluster of rocks is situated 3½ miles east of Kayeta Saki (Cape Cochrane).

Note.—The channel between these rocks and the mainland is clear of danger. *Variation*, 3½° *W.*

283.—JAPAN.—*Nipon.—South Coast.—Gulf of Tokio or Yedo.—Yokohama Bay Light-Vessel.—Fog-Signal.*—A fog-signal has been established on board the light-vessel placed at the extremity of the shoals off Mandarin bluff, Yokohama bay; it is a bell, which, during thick or foggy weather, will be sounded *five times* in quick succession at intervals not exceeding *five minutes.*

284.—JAPAN.—*Yesso (Yezo) Island.—South Coast.—Hakodate Light-Vessel.—Fog-Signal.*—Established on board the light-vessel placed off the northern extremity of Anama spit, Hakodate (Hakodadi) harbour; the signal is a bell, which, during thick or foggy weather, will be sounded *five times* in quick succession at intervals not exceeding *five minutes.*

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285.—AUSTRALIA.—*N.E. Coast.—Sand Bank Reported in Margaret Bay.*—This sand bank, with 3 feet over it at low water spring tides, lies in the southern part of Margaret bay, with the following bearings and distance:—Northern extremity of Cape Grenville, E. by S. ¼ S.; centre of Sunday island, N. by W., distant one mile. This bank, though out of the main navigation, is a danger to vessels seeking anchorage in Margaret bay, or working along the coast under shelter of Cape Grenville. *Variation*, 5¼° *E.*

286.—NEW ZEALAND.—*Middle Island.—East Coast.—Alteration in Timaru Principal Light.*—On May 1, 1882, the following alteration would be made in the principal light exhibited at Timaru harbour:—The light now shows *fixed green* seaward between the bearings of W. and S.W., and *fixed white* as previously in other directions. *Variation*, 16½° *E.*

287.—NEW ZEALAND.—*Shoal in Foveaux Strait.*—A shoal has been discovered about 4 miles eastward of Ruapuke island, eastern entrance of Foveaux strait. This shoal (*Fairchild shoal*) has over it a depth of 4 fathoms, rocky bottom, with from 7 to 12 fathoms around, and lies with the following bearings:—Green island, east extreme, S.W. by S., distant 4¼ miles; Toby rock (awash), S.W. ¼ W., distant 2 miles; Dog island lighthouse, W. ¼ N., distant 11½ miles.

Note.—The breakers formerly charted at 2 miles N.N.E. ¼ E. from Toby rock, are considered not to exist, and have been expunged from the Admiralty charts. *Variation*, 17° *E.*

288.—UNITED STATES.—*California.—San Francisco.—Wreck on the Bar.*—The steamer *Escambia*, which sailed from San Francico on June 19th with a cargo of wheat, capsized and sank the same evening off the port, and constitutes a dangerous impediment to navigation. The wreck lies in 6 fathoms at low water spring tides, with the following bearing and distance, viz.:—Bonita point new lighthouse, N. by E. ¼ E., distant 5¼ miles. A light-vessel has been placed to mark the site of the wreck, and during thick and foggy weather a bell will be rung. *Variation*, 16½° *E.*

289.—WEST INDIES.—*New Granada.—Disappearance of Zamba Island.*—The Liverpool Salvage Association states that the low sandy neck of land known as the island of Zamba (Galera de Lamba),

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on the northern side of Ensenada de la Galera de Zamba, about midway between Savanilla and Cartagena, has by the action of the sea, within the last few months, disappeared, and no part appears above water. As the water is shallow and often quite smooth over the position of the island, mariners should use great caution when navigating in the vicinity.

290.—West Indies.—*Puerto Rico.*—*Light on Cape Rojo.*—On 1st July, 1882, a light will be exhibited from a lighthouse erected on Cape Rojo, S.W. extreme of Puerto Rico. It will be a *white* light with eclipses *every minute*, elevated 49 feet above the ground and visible from a distance of 18 miles. The building, rectangular in shape, and tower pyramidal, are painted dark gray, with white walls. Position approximate, lat. 17° 56′ 0″ N., long. 67° 9′ 30″ W.

Charts, &c., Published by the Hydrographic Department, Admiralty, in May and June, 1882.

No.		*s.*	*d.*
2860	North America, east coast:—Savannah river to St. Helena sound, including Calibogne sound, port Royal and Broad river	2	6
2861	North America, east coast:—St. Helena sound to Charleston harbour, including the North and South Edisto rivers	2	6
304	France, west coast:—Port Louis and Lorient ...	1	6
612	North America, east coast:—Little Spoon island to Pemaquid point, including entrance to Penobscot bay	2	6
905	Fiji islands:—Suva harbour to Levuka, with the adjacent islands to the eastward, Ngau, Nairai, Mbaliki, Wakaya, and Makongai...	2	6
644	Africa, south-east coast:—Delagoa bay (Lorenzo Marques)	2	0
623	Africa, west coast:—Fernando Po island (plans, Santa Isabel (Clarence) and adjacent bays. San Carlos (George) bay)	1	6
1598	English channel	4	0

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No.		s.	d.
496	South Indian ocean :—Saya de Malha bank ...	1	0
450	West Indies :—Pedro bank and adjacent coast of Jamaica (plans, Banner reef, Middle and South-west cays. North-east cay. Portland rock) ...	1	6
691	Australia, north-east coast :—Normanby sound and Prince of Wales Channel...	1	6
160	Italy, west coast :—Civita Vecchia to Policastro. (Plans, Port Anzo. Gaeta bay. Agropoli bay. Mouth of the Tiber)	2	6
146	Africa, west coast :—Niger river (Nun entrance). Brass river	1	6
628	Africa, west coast :—Opobo river. Quaebo river...	1	0
622	Africa, west coast :—Bonny and New Calabar rivers	1	6
2046	Ireland, south coast :—Waterford harbour ...	2	6
259*a*	St. Lawrence river :—Montreal to Ogden island ...	2	0
259*b*	St. Lawrence river :—Ogden island to Kingston ...	2	0
1862	Plan added. River Benin entrance.		

CHARTS THAT HAVE RECEIVED IMPORTANT CORRECTIONS.

No.

2177. Arctic sea :—Baffin bay.
2282. Arctic ocean and Greenland sea.
941*a*. Eastern Archipelago, western portion.
1944. North America, west coast :—Port Acapulco.
243. Mediterranean :—Port of Alexandria.
447. Australia, north coast :—Western approaches to Torres strait.
2892. North America, east coast :—Narraganset bay.
2252. Baltic sea :—Gulf of Bothnia.
2239. Baltic sea :—St. Petersburg bay and city.
2023. Malacca strait :—Singapore new harbour.
2205. Black sea :—Kertch strait.
4. Indian ocean :—Principal groups of Chagos archipelago.
1887. North sea :—Eider river to Blaavand point.

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HYDROGRAPHIC NOTICES RECENTLY PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, 1882.

No.

No. 17.—AFRICA PILOT, Part 1. Relating to river Volta.

No. 18.—SOUTH INDIAN OCEAN. Relating to the coast of Madagascar.

No. 19.—AUSTRALIA DIRECTORY, Vol. 2. Relating to east coast of Australia and inner passage to Torres strait.

No. 20.—SOUTH INDIAN OCEAN. Relating to Saya de Malha bank.

No. 21.—AFRICA PILOT, Part 2. Relating to harbours and anchorages on west coast of Africa.

No. 22.—PACIFIC OCEAN. Relating to islands in Ellis, Gilbert, and Marshall groups.

BOOKS.

	s.	d.
The Channel Pilot, part 2. Coast of France and the Channel islands, 4th edition, 1882	5	0
North Sea Pilot, part 3. East coast of England, 4th edition, 1882	4	6

OUR OFFICIAL LOG.

OFFICIAL INQUIRIES AT HOME, 1882.

1390. *Frank*, barge, and *Derwent*, s.s.; the former owned by J. P. White & Co.; tonnage, 47; Swanscombe, Kent, to Westminster; cement; the latter built at Sunderland, 1880; owned by R. M. Steam Packet Co.; tonnage, 1,605; London to Southampton; in collision in St. Clement's Reach, R. Thames, February 25, 1882; barge sunk; one man drowned. Inquiry held at Westminster, June 7, 1882, before Rothery, Wreck Commissioner; Murdoch, Ward and Moresby, N.A. Casualty due to want of good look-out on board *Derwent*. Some blame attached to chief mate and river pilot in charge.

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1391. *Albert Edward*, s.s.; built at Poplar, 1862; owned by S. E. Railway Co.; tonnage, 198; Boulogne to Folkestone; passengers and fruit; starboard cylinder burst, April 18, 1882. Inquiry held at Westminster, June 12, 1882, before Rothery, Wreck Commissioner; Curling, Anderson and Eames, N.A. Thread of piston-rod had deteriorated; no one to blame. Harbour master at Folkestone ought to have sent assistance.

1392. *Eta*, ship; built at Bristol, 1865; owned by Swansea Merchants Shipowners Company; tonnage, 494; Swansea to Valparaiso; coals; damaged by spontaneous combustion of coal cargo, October 12, 1881. Inquiry held at Swansea, June 13, 1882, before Fowler, Judge; Castle and Davies, N.A. Casualty due to the fact that the coal contained pyrites, sulphur and dirt, and part was shipped in a wet condition. No blame to captain or officers.

1393. *Firth of Cromarty*, barque; built at Greenock, 1880; owned by Mr. Jas. Spencer; tonnage, 909; Rangoon to Falmouth; rice in bags; missing. Inquiry held at Westminster, June 16, 1882, before Rothery, Wreck Commissioner; Forster and Pickard, N.A. No evidence to show how she was lost.

1394. *Maggie*, brigantine; built at Nova Scotia, in 1874; owned by Joseph Inness; tonnage, 270; Cardiff to Demerara; coals; damaged in a squall; one man killed; May 26, 1882. Inquiry held at Swansea, June 16, 1882, before Fowler, Judge; Rees and Davies, N.A. Ship plunged in heavy squall; fore-yard fell on boatswain. No blame to master or mate.

1395. *Marmion*, s.s.; built at Hartlepool, 1871, owned by Mr. T. E. Pyman; tonnage, 601; Soderhanen to Lynn; deals; stranded on Grundkalle Shoal, May 15, 1882. Inquiry held at Middlesbro', June 14, 1882, before Coleman, Judge; Comyn and Ward, N.A. Master guilty of negligent navigation. Certificate suspended for three months. Chief mate severely reprimanded.

1397. *Columba*, s.s.; built at Sunderland, 1872; owned by Mr. W. H. Senior; tonnage, 644; the Tyne to Naples; coals; injured from explosion of donkey boiler, April 26, 1882, when loss of life ensued. Inquiry held at North Shields, June 16, 1882, before Spence and Jackson, Justices; French and Lang, N.A. Explosion occasioned by an accumulation of salt in the water

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space of the boiler. Chief engineer in default. Certificate suspended for three calendar months.

1398. *Hazelwood*, barquentine; built at Mount Stewart, Prince Edward's Island, 1875; owned by Messrs. T. and W. Daniel and others; tonnage, 354; Philadelphia to West Indies; coals; foundered at sea, April 18, 1882. Inquiry held at Westminster, June 21, 1882, before Rothery, Wreck Commissioner; Vaux and Harland, N.A. The topmast-backstay having carried away, the foremast yards and rigging went overboard, and the wreckage beating against the side of the vessel caused her to leak and subsequently founder. No blame attached to master.

1399. *Mary Ann*, schooner, *Sceptre*, s.s.; the former built at Stanley Ferry, 1870; owned by Mr. T. Eastwood; tonnage, 56; Millwall Docks to Goole; guano; the latter built at Jarrow on Tyne, 1873; owned by Hall Bros.; tonnage, 1,110; London to Cardiff; ballast; in collision near Middle Blyth Buoy, River Thames, April 25, 1882. Inquiry held at Westminster, June 20, 1882, before Rothery, Wreck Commissioner; Hight and Hyde, N.A. Collision due to an inefficient look-out being kept on board the *Sceptre*, and an error of judgment on the part of her master in porting instead of starboarding his helm. Certificate not dealt with.

1401. *Vanguard*, s.s.; built at Newcastle, 1872; owned by H. Bucknall and Sons; tonnage, 566; Lisbon to London; iron pyrites and cork; supposed to have foundered at sea. Inquiry held at Westminster, June 23, 1882, before Rothery, Wreck Commissioner; Aplin and Ronaldson, N.A. Vessel perfectly seaworthy and not overladen when leaving Lisbon. No evidence as to cause of loss.

1402. *Constantine*, barque; built at Brockweir, Gloucestershire; owned by Mr. J. E. Oldridge; tonnage, 506; Cardiff to Bahia; coal and iron; lost near Paranahyba River, Bristol, April 9, 1882. Inquiry held at Liverpool, June 28, 1882, before Raffles, Judge; Parfitt and Wilson, N.A. Casualty due to striking on the bar, entrance to Rio Grande, whilst in charge of pilot. No blame attached to master.

1406. *Vesper;* built at Salcombe, 1874; owned by Mr. J. Adams; tonnage, 265; La Brea, Trinidad, to Dieppe; asphalte;

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supposed to have foundered at sea. Inquiry held at Westminster, July 3, 1882, before Rothery, Wreck Commissioner; Powell and Curling, N.A. Probably foundered in heavy gales which prevailed in the Atlantic about the time that she would be crossing.

1407. *Titania*, s.s.; built at Middlesborough, 1880; owned by Titania Steamship Co.; tonnage, 1,278; New York to Newcastle; provisions, &c.; supposed to have foundered at sea. Inquiry held at Westminster, July 4, 1882; before Rothery, Wreck Commissioner; Castle and Grant, N.A. Vessel perfectly seaworthy and not overladen when leaving New York. No evidence as to how she was lost.

1409. *Archibald Fuller*, barque; built at Liverpool, 1869; owned by Mr. H. Coghill; tonnage, 699; San Francisco to Queenstown; grain, &c.; supposed to have foundered at sea. Inquiry held at Liverpool, July 6, 1882, before Raffles, Judge; Forster and Grant, N.A. No evidence as to cause of loss.

1410. *Iron Era*, s.s.; built at Stockton-on-Tees, 1856; owned by Mr. C. Young and others; tonnage, 887; Gothenburg to United Kingdom; grain, &c.; abandoned on the Dogger Bank, June 6, 1882; subsequently foundering. Inquiry held at Swansea, July 4, 1882, before Spence and Tully, Justices; Ward, Ward and Lang, N.A. Casualty caused by defect in hull or keel. Chief engineer to blame for leaving the vessel without the master's consent. Certificate suspended for six months.

1412. *Zizine*, barquentine; built at Wivenhoe, in 1861; owned by Messrs. Bartlett and Co.; tonnage, 171; Santander to Newport; iron ore; foundered at sea, May 17, 1882. Inquiry held at Westminster, July 10, 1882, before Rothery, Wreck Commissioner; Vaux and Ronaldson, N.A. Loss occasioned by vessel having suddenly sprung a leak, but how caused or where the leak was there is no evidence to show. Master free from blame.

Official Inquiries Abroad.

1389. *Garstang*, barque; struck on rocks near Haitan Island in a fog, April 21, 1882. Naval Court held at Amoy, April 29, 1882. No blame to master and officers. Ship invaded and robbed by large body of piratical nations.

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1396. *Novara*, ship; abandoned on fire, March 14, 1882. Naval Court held at Valparaiso, May 2, 1882. Fire caused by spontaneous combustion of coal cargo. No blame to master or mate.

1400. *Lady Belmore*; lost near Pioneer River, March 8, 1882. Inquiry held at Toowoomba, April 15, 1882. Master to blame for not using every endeavour to save ship and stores. Certificate suspended for three months.

1403. *Patea*, s.s.; Lost near mouth of Patea River, April 11, 1882. Inquiry held at Patea, N.Z., April 27, 1882. Master to blame for not attending to signals made to him to keep to the eastward. Certificate suspended for three months.

1404. *Koputai*, s.s., and *Waitaki*, s.s.; in collision at Port Chalmers, March 16, 1882. Inquiry held at Dunedin, April 4, 1882. Second engineer to blame for not attending promptly to the orders of the master to go astern.

Spontaneous Combustion in Coal Cargoes.—It has been represented to the Board of Trade that some of the recent losses of coal-laden vessels by spontaneous combustion in coal might have been avoided if means had been employed to detect the first indication of heating. The Board, therefore, call the attention of owners, agents, and masters of vessels carrying coal on long voyages, to the fourth recommendation of the Royal Commissioners, who, in the year 1876, reported on the subject of spontaneous combustion of coal in ships, which is as follows:—"That when coal is being carried on long voyages, the temperature in the various portions of the cargo should be tested periodically by thermometer, and registered in the log." Whilst urging on shipmasters and others the importance of attending to the foregoing recommendation, with a view of obtaining early information as to the heating of a coal cargo, the Board desire to impress upon shipowners, also, the great importance of attending to the recommendations of the Royal Commissioners which relate to the prevention of spontaneous combustion of coal in ships.—Thomas Gray, Assistant-Secretary, Marine Department, Board of Trade, July, 1882.

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REGULATIONS FOR PREVENTING COLLISIONS—GENERAL AND LOCAL.

IT is a circumstance calculated to cause general surprise and most of all to those who are familiar with the numerous and minute decisions of our Courts as to the meaning of almost every article of the Regulations for Preventing Collisions at Sea, that, during the period, now close on 20 years, that such Rules have been in force, there has not been one single decision exactly defining in what places they do or do not apply. The first difficulty is whether the word "Sea" in the Title of the Regulations is to be taken (1) in its most extended form as opposed to land, as for example, it is used in the Bible, "The Lord made heaven and earth, the sea and all that is therein" (Exod., xx., 11.); or (2) in its ordinary colloquial sense when it would include the estuaries of rivers, so far as they were salt or nearly salt, and all bays, creeks and inlets; or (3) in the legal sense, as defined by Lord Hale, "where the sea flows and reflows, and so far only as the sea flows and reflows; so that the river of Thames above Kingston, and the river of Severn above Tewkesbury, &c., &c., though they are publick rivers, yet are not

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arms of the sea. But it seems that although the water be fresh at high water, yet the denomination of an arm of the sea continues if it flow and reflow, as in the case of the Thames above the bridge," (Hale, De Jure Maris, Pt. I., ch. iv. sec. 2); or (4) in its confined and special legal sense of the "Main or High Sea," and as opposed to rivers, lakes and other bodies of water within the body of a county. "The part of the sea which lies not within the body of a county" (Hale, De Jure Maris, Pt. I., ch. iv.) The special geographical sense of sea, *i.e.*, of a large body of water almost or entirely surrounded by land, as the Caspian or Black Sea, may be left out of consideration for our present purpose. To test these various definitions of the "Sea" we may conveniently refer to a case, familiar to most of the readers of this Magazine, that of the River Thames. Apart from local rules, if (4) be correct the rules enacted in Table C. would cease to have any operation so soon as the entrance to the river narrowed to such an extent that a "man may reasonably discern between shore and shore;" as from that point the water "is or at least may be, within the body of a county," that is probably at some point near the Nore;* if (3) is the more accurate definition, the Regulations for Preventing Collisions at Sea, would apply as far as Teddington (Tide end town) Lock; if (2) they would apply up to some point near Woolwich where the water becomes drinkable, so far as the absence of salt is concerned; and if (1) is accurate then the Rules apply as far as a steam launch can ascend the river above Oxford. As to the space over which the Conservancy Regulations for the Navigation of the River Thames operate, there can be no doubt as to powers of the Conservators to make rules which apply as far down the river as Yantlet Creek, but no further. Hence if (4) be right there is a sort

* A case is now being litigated in which, after two trials by a special jury at Guildhall, the question is still undecided and has to go down for trial a third time as to what is the meaning of "at the mouth of the River Thames," it being contended on the one hand that a vessel having reached the Mouse Lightship was 23 miles inside the mouth, and on the other that she was still at the Mouth of the Thames. (See Leary & Co. v. Steeres & Co., *Law Times*, March 18, 1882, p. 253.)

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of interregnum, a no-man's water for which no rules are in force, which it may be observed would include the whole navigable part of the River Medway; if either (1, 2 or 3) are correct, it may be a question whether the "Regulations for Preventing Collisions at Sea" are ousted or in any way affected by the "Regulations for the Navigation of the River" over the part of the river bed which would be *primâ facie* subject to the sea Regulations.

It is proposed in this paper to consider (I.) which interpretation of the familiar word "Sea" is correct; and (II.) the effect of Local rules on the General Regulations for Preventing Collisions where the former are made by lawful authority for a place *primâ facie* subject to the latter.

I. In favour of the view of the most extended signification of the word "Sea," a decision or dictum of the Court of Admiralty in Ireland may be cited (the *City of Paris*—Holt—"Rule of the Road," 18), and it may be pointed out that the decree of the French Emperor enacting those rules for French vessels makes no mention of the sea at all, but refers only to those *qui ont pour objet de prevenir les abordages* (D.L., 1863-4-7).*

It must also be borne in mind that the delicate distinctions of English law of High Seas, King's Chambers, &c., are not known to the law of continental nations, which regards the *ship* as the subject of the law and only affected by their position so far as it is *en pleine mer*, or within the territorial jurisdiction of its own or some other country. It would therefore appear that the Regulations apply to French ships by French Law wherever they may be, and by virtue of the Convention with England with respect to these Rules, that they are to affect the ships of each nation, whether within the jurisdiction of either or not (see also Merchant Shipping Act, 1862, sec. 58): it follows that British ships,

* The Act of Congress (38th Cong., Sess. 1, Ch. 69) enacting the original rules of 1863 for the United States describes them as "Regulations for Preventing Collisions on the *Water*," and the Act of the Dominion of Canada (31 Vict., c. 58) simply as "Regulations for Preventing Collisions," but in both these cases they were meant expressly to apply to all navigable waters, whether inland or not, and independently of any direct communication with the sea or jurisdiction of the Admiralty.

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when the case is to be decided in a French Court, are liable to the French interpretation of the Rule, and that therefore in every case of a collision, whether on the high seas or in any inland navigable water, such vessels will, in the absence of special rules for that place, be held to be subject to the Sea Regulations. Of course, Table C. in English Law *may* have a different operation from the corresponding regulations in French Law, but seeing they are counterparts of the same convention, and that there is an ambiguity in the English version, the French version, in which there is no such ambiguity, would appear to throw some light on what is the true intent of the English version.*

In the earliest Statute as to Regulations for Preventing Collisions at Sea (9 & 10 Vict., c. 100), the Admiralty had authority to make regulations for lights to be carried by British steamships (sec. 36) in any place except the River Thames above Yantlet Creek (sec. 10), and persons in charge of such vessels were bound to obey the regulations on pain of not recovering any damage sustained by them when "in *any river* or narrow channel in Great Britain or Ireland, or the adjacent Islands, or upon the sea within 20 miles of any part of the coast of Great Britain or Ireland." (Sec. 12.) Here, though a distinction is drawn between the *sea*, on the one hand, and rivers and narrow channels on the other, the regulations apply, with the exception of the river Thames, to all navigable waters within British exclusive jurisdiction.

The next provision on the subject is still more explicit, as in the Admiralty Regulations of 1852, made under the authority of the Steam Navigation Act, 1851 (14 & 15 Vict., c. 79), the regulations as to lights are to be obeyed by "all British sea-going steam-vessels," and also, apparently, so far as they are applicable, by

* French law does, for some purposes, draw a distinction between Maritime Navigation and internal navigation, as, for example, in the case of the *rôle d'equipage* required for vessels employed in the former, and for such purposes Maritime Navigation is held to be the navigation of any waters communicating with the sea in such a way that they are periodically impregnated with more or less salt water (Rec. Gen., 1863—2—195); but nowhere are the Regulations for Preventing Collisions limited to Maritime Navigation.

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sailing vessels also, "within all seas, gulfs, channels, straits, bays, creeks, roads, roadsteads, harbours, havens, ports, and rivers, and under all circumstances, between sunset and sunrise," . . . . "except within harbours or other places where regulations for other lights for ships are legally established." These regulations remained in force after the passing of the Merchant Shipping Act, 1854 (the *Mangerton*, Swabey, 120), (though the Act (14 & 15 Vict., c. 79) under which they were made, was repealed by the Merchant Shipping Act Repeal Act (17 & 18 Vict., c. 120)), until revoked by the Admiralty Regulations of 1858, in which no limitation is contained as to the locality in which the lights are to be carried, the order being general for "All Sea-going Vessels." These regulations were made under sec. 295, sub-sec. 1 of the Merchant Shipping Act, 1854, which enacted that "the Admiralty shall from time to time make regulations requiring the exhibition of such lights by such classes of ships, whether steam or sailing ships, within such places and under such circumstances as they think fit." And the Admiralty, whilst limiting themselves to making orders for only those classes of vessels which were "sea-going," did not limit themselves in any way as to the locality in which the rules were applicable to sea-going vessels. Hence they were held to be applicable to a sea-going sailing vessel in the Thames (Morrison *v.* General Steam Navigation Company, 22 L.J. (Exch.) 233, 21 L.T. 76). And these rules remained in force until the Merchant Shipping Act Amendment Act, 1862, brought in force the regulations contained in Table C. That Act did not, it is true, directly repeal the rules of 1858, but it did repeal the sections giving the power to make rules to the Admiralty, alone and vested this power in the Crown on the advice of the Admiralty and Board of Trade jointly, and therefore the rules made by the Admiralty under the former statute ceased to be effective. So far as to the rules as to lights.

The first written rules of navigation, in contradistinction to the unwritten law of the sea as to vessels going free giving way to vessels on a wind, and vessels on the port-tack giving way to vessels on the starboard-tack, were those contained in a regulation of the Trinity House of the 30th October, 1840, which were called for by

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the gradual increase of steam-vessels, and which stated what was already recognised in practice, that steam-vessels were to be considered as "vessels navigating with a fair wind," and were, therefore, to give way to all vessels close-hauled, and, when approaching each other, so as to involve risk of collision, that both were to port their helms. And also that, when one steamer was passing another in a narrow channel, she was always to leave the other on the larboard hand. These regulations, not being issued under any statutory power, could not, of course, be of effect except as natural extensions of a Rule of the Road—already well-known—to the novel circumstances of steam navigation, and as such, they would be co-extensive in their application to that rule, and hence undoubtedly governed the navigation of rivers (the *Friends*, 1 W. Rob., 478) so far as British ships were concerned, though their applicability to foreign ships anywhere would be doubtful. Anyhow, in 1846, the regulation was embodied in a Statute (9 & 10 Vict., c. 100) entitled "*An Act for the Regulation of Steam Navigation and for requiring Sea-going Vessels to carry Boats*," of which sec. 9 is as follows :—

"That every steam-vessel when meeting or passing any other steam-vessel shall pass as far as may be safe on the port-side of such other vessel; and every steam-vessel navigating *any river* or narrow channel shall keep as far as is practicable to that side of the fairway or mid-channel of such river or channel which lies on the starboard-side of such vessel, due regard being had to the tide and to the position of each vessel in such tide . . . ."

Sec. 13. Enacts that any damage sustained in consequence of the non-observance of these rules shall, in the absence of proof to the contrary, be deemed to have been caused by the wilful default of the master or person in charge, and

Sec. 36. Limits the operation of the Act to British registered vessels, excluding expressly Her Majesty's vessels of war.

This Act remained in force until 1851, when it was repealed by the Steam Navigation Act, 1851 (14 & 15 Vict., c. 79), and in substitution for the provisions of secs. 9, 13, and 36 respectively, it was enacted by

Sec. 27. "Whenever any vessel proceeding in one direction

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meets a vessel proceeding in another direction, and the master or other person having charge of either such vessel perceives that if both vessels continue their respective courses they will pass so near as to involve any risk of a collision, he shall put the helm of his vessel to port so as to pass on the port-side of the other vessel, due regard being had to the tide and to the position of each vessel with respect to the dangers of the channel, and as regards sailing vessels, to the keeping of each vessel under command; and the master of any steam-vessel navigating any river or narrow channel shall keep as far as is practicable to that side of the fairway or mid-channel thereof which lies on the starboard-side of such vessel . . . ."

Sec. 28. Enacts, in addition to the provision of sec. 18 of the previous Act, that no owner shall be entitled to receive compensation for damage sustained in a collision in consequence of the non-observance of the rules by his vessel.

Sec. 48. Limits the operation of the Act to British vessels or vessels owned wholly, or in part, by British subjects, excluding Her Majesty's ships and steam ferries working in fixed chains.

The Steam Navigation Act, 1851, was in its turn repealed by the Merchant Shipping Act, 1854: secs. 296, 297, of which Act took the place of sec. 27 of the former Act, and were to the same effect, except that the words used in sec. 297 are "any narrow channel," instead of "*any river* or narrow channel," as in the former Act, but nevertheless the statutory rule was held to apply in a river, and even in the river Thames, to British ships (*The Seine*, Swabey 411), and to be extended as a customary mode of navigation to foreign ships in British waters (*The Fyenoord*, Swabey 374), although the part of the Act (Part ix.) is limited in its application by sec. 291—which corresponds to sec. 48 of the former Act—to British ships and foreign steamships carrying passengers between places in the United Kingdom.

Secs. 296, 297, of the Merchant Shipping Act were in their turn again repealed by the Merchant Shipping Act, 1862, under the provisions of which for the first time the rules as to lights, treated of above, and those as to navigation, were brought together in Table C. Seeing then that whether *rivers* were or were not

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expressed in the former regulations, whether such regulations were contained in the Statutes themselves or made by authority under the Statutes, they were always uniformly considered to be governed by them it seems extraordinary that they should be excluded from the operation of the New Regulations, and the extreme improbability of its being the intention of the legislature to exclude them would seem, if the word "sea" is capable of two meanings in the heading of these rules, to give it the larger meaning, which would include navigable rivers.

If we turn to those regulations themselves there appears to be considerable confirmation of the view that they were intended to apply in rivers. Thus Art. 7 prescribes the light to be carried by vessels when at anchor in roadsteads or *fairways*, the latter term being peculiarly applicable to a river, though no doubt applying also to narrow channels of the sea; and Art. 19 would also appear from its wording to be more applicable to river navigation than to dangers caused by the proximity of other vessels at sea.

Again, looking to the context of the Merchant Shipping Act, 1862, we find, sec. 27, which obliges owners and masters to obey the regulations is even broader in its application than the corresponding sections of the former Acts; and sec. 31 enacts that "Any rules concerning the lights or signals to be carried by vessels navigating the waters of any harbour, river or other inland navigation, or concerning the steps for avoiding collision to be taken by such vessels, which have been or are hereafter made by or under the authority of a Local Act, shall continue and be of full force and effect notwithstanding anything in the Act or in the Schedule thereto contained." If the Table C. applied only at sea, as distinguished from "harbours, rivers or other inland navigation," this section would be unnecessary, as the Regulations of Table C. would not touch any such waters or the regulations for their navigation; further, the next section (sec. 32) conferring upon Her Majesty in Council power to make rules for "any harbour, river or inland navigation" where there are no rules nor power to make them under a Local Act, says that "such rules . . . shall so far as regards vessels navigating such waters, *have the same effect as if they were regulations contained in Table C.*" If Table C.

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applies only to regulations for the sea as distinguished from rivers, &c., such rules having the *same effect* would, though made expressly for such river, have no effect then, because Table C. does not apply to such place, which certainly seems an absurdity. It is moreover to be observed that Table C., or the regulations substituted for Table C. by Order in Council of 14th August, 1879, and now in force, are, by sec. 25 of the Merchant Shipping Act, 1862, "to be of the same force as if they were enacted in the body of the Act," and that Art. 8 of those rules prescribes an anchor light for all vessels at anchor, not merely for those at anchor in a roadstead or fairway as in the previous regulations, and Art. 23 practically re-enacts Art. 19 of the former regulations. There are two articles introduced bearing upon this question, one of which (Art. 21) is the same, with merely verbal difference, as sec. 277 of the Merchant Shipping Act, 1854, requiring a vessel in a narrow channel to keep on the starboard-side of such channel, and the other (Art. 25) is in these words: "Nothing in these rules shall interfere with the operation of a special rule duly made by local authority, relative to the navigation of any harbour, river or inland navigation." If then as already observed with regard to the construction of secs. 31, 32 of the Merchant Shipping Act, 1862, these rules do not, *primâ facie*, apply to inland waters at all, because they are confined to the sea, the above Article (25) has no meaning whatever; and, further, local regulations, such as those recently issued for the Humber and its tributaries, which require the Regulations for Preventing Collisions at Sea to be observed, with certain exceptions, are inoperative, if a vessel in inland waters is not affected by those regulations. In several cases, moreover, it has been held that collisions not only between British vessels (the *Velocity*, L.R. 3 P.C. 44; the *Ranger* and the *Cologne*, L.R. 4 P.C. 519), but also between British and foreign vessels which occurred in the River Thames (the *Esk* and the *Niord*, L.R. 3 P.C. 436; the *Concordia*, L.R. 1 Ad. & Ecc., 93) were governed by the regulations in Table C., in the absence, at all events, of local regulations, none of which, on this point of navigation, had at the time been made by the Thames Conservancy. In these cases, whether

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of collision between British, or between British and foreign vessels, the argument of a customary rule emanating from a statute which was held to apply to foreign ships in the *Fyenoord* (Swabey 374) would not be applicable, unless the General Regulations for Preventing Collisions at Sea are of force in a river.

If on consideration of the various arguments already adduced, it may be considered that the word "sea" has to be interpreted with the larger definition of, at all events, navigable water communicating directly with the main ocean ;* then the consideration (II.) presents itself how far they are affected by local regulations. On this point there has been a decision (the *C. S. Butler*, L.R. 4 Ad. & Ecc., 238), which at first sight would seem to imply that they were altogether ousted by local regulations; but it is submitted that such is not the case. The question in that case was whether a sailing barge used exclusively in a part of the River Thames which was within the jurisdiction of the Conservancy, was bound to carry the lights required by the General Regulations, the Conservancy Rules at that time in force† having no regulations as to sailing vessels' lights. The learned judge of the Admiralty Court considered himself bound by a previous decision of the Queen's Bench (*Ex pte.* Ferguson, L.R. 6 Q.B. 280), to hold that "ship" in Art. 5 of the General Regulations meant only a vessel "whose real habitual business was to go to sea," and that therefore the General Regulations did not apply to any vessel exclusively used in river navigation; as very recently the Court of Appeal have given a far more extended meaning to the word "ship" (*the Mac*, Mit. Mar. Reg., 1882, p. 844), the earlier decision cannot now be considered as of much authority even on that

* This would appear, in some respects, a more comprehensive definition than that given above (Hale, de Jure Maris, Part I., Ch. iv., sec. 2), and would be about co-extensive with that given in the Statute 15 Rich. II., c. 3: "the main stream of great rivers where great ships come and go," leaving out, however, the limitation there given whether that limitation "infra primos pontes" be interpreted below the first bridges or outside the first points of land.

† This has since been altered (Order in Council, 18th March, 1880), and there is now no doubt that a sailing barge has to carry the same lights in the Thames as a sailing ship at sea.

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point, but nevertheless as it recognises the duty of sea-going ships to carry the lights required by the General Regulations, even in a place where local regulations are in force, which are silent as to sailing ships' lights; it appears to be an authority for saying that the General Regulations are of full force side by side with local regulations, which are not inconsistent with them.

This principle is expressly recognized in the local rules in force in several places, *e.g.*, the Rules for the Mersey, 27th June, 1866, and those for the Humber, Ouse and Trent, 19th December, 1881, which expressly say that all vessels navigating those waters shall obey the "Regulations for Preventing Collisions at Sea," except in the particular respects thereinafter mentioned.

In other places, the general rules are reinacted with such alterations as render them applicable to dumb craft as in the Tyne, and the Tees, and Cork Harbour, &c.

In some cases, however, there is an obvious and important inconsistency, as, *e.g.*, at Belfast, where by sec. 67 of the Local Regulations (Marsden on Collisions, p. 262) the rule of port-helm is applied indifferently to all steam-vessels crossing or meeting, and a similar regulation appears to exist for all vessels, whether steam or sailing, in the Clyde. (Article 3, Marsden, p. 264); where such is the case no doubt, if the local regulations are properly made, under or before the Merchant Shipping Act, 1862, or by private Act, they will oust the General Regulations.

But cases may arise, and, in one instance at least, are almost certain to arise very shortly—where the General Regulations contain a provision on a matter as to which the Local Regulations are silent.

The particular case in question is that contained in Art. 21 of the General Regulations now in force, viz., that in narrow channels steamships "shall when it is safe and practicable keep to that side of the fairway or mid-channel," which lies on their starboard-side. This rule as already observed was a statutory rule until 1862, when by the Merchant Shipping Act of that year it was repealed, out of consideration, as has generally been supposed, at all events, for the special circumstances of the Thames. It is found in some

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shape or another in the Local Regulations of the Mersey Sea Channels (37 & 38 Vict., c. 52, sec. 1, sub-sec. 1); Belfast (sec. 67, Marsden, 262); the Clyde, for all vessels excepting sailing ships beating to windward (Art. 3, Marsden, 264); Cork (Arts. 85, 89, Marsden, 266); the Tees for all ships (Clauses 17, 18, 19); the Tyne for all vessels (Clauses 17, 18); and it is not inconsistent with anything in the present Thames Conservancy Rules, except, indeed, that Arts. 22 and 26 of the Rules of 1880, which, prescribe the use of port-helm for meeting ships, would be rendered unnecessary by its adoption.

If it does not apply to that portion of the Thames within the jurisdiction of the Conservancy, there is likely to be trouble in the neighbourhood of Yantlet Creek, as at that point vessels coming up will cease to be bound to hug their starboard-shore, and vessels coming down will have at that point to get into their starboard-shore, and hence will be crossing each other's courses in all directions. If the principle of the *C. S. Butler* (L.R. 4 Ad. & Ecc., 238) is to be followed, than all sea-going steamships are bound to observe the sea rule, but river tugs and steam launches are not, nor, it would appear, sailing vessels in tow of river tugs.

It is certainly undesirable that any ambiguity should exist on such a point, and whilst expressing a strong opinion that since the time at which the new General Regulations came into operation it is obligatory on steamships in the Thames, as well as elsewhere, to obey Art. 21 of these regulations, it would be well to have an authoritative statement on the point at once, and not wait till it is decided by a Court of Law after a disastrous collision.

Seeing the nature of collisions which take place in the Thames almost daily, and the immense loss of life and property entailed thereby, it would surely be wise and prudent, not to say humane, to enforce an enactment which would prevent the greater number by far of these collisions, even at the expense of perhaps causing steam-vessels to encounter the tide for half an hour longer than they otherwise would do. Probably if universally in force the average time consumed in running up or down the river would be diminished from the fact that as no steam-vessels would be met coming in such direction as to involve risk of collision, the engines

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would not be so constantly eased, stopped and reversed, and probably the saving of time and wear and tear of machinery, and of that most complex machine of all, the mind of man, would more than compensate for the extra shovelfull of coal required to face the tide instead of cheating it. F. W. R.

THE PANAMA CANAL.

IN the midst of the grave crisis which has arisen in connection with Egyptian affairs, the Panama Canal question seems to have quite lost its hold on the public attention. That such should be the case is perfectly natural. At the present time the difficulties in which we find ourselves involved in, the East are not to be compared with the more problematical dangers that are looming in the West. In the one case they are only too definite and real; in the other they exist merely on paper; and, while one question is being decided by the sword, the other still forms a subject for the diplomatist's pen. Yet, in spite of the small importance which the Panama Canal affair seems now to possess, in comparison with the Egyptian difficulty, it is by no means unlikely that the day will arrive—and that at no distant date—when the case will be otherwise, and when the former will become a question of the utmost gravity.

As regards the possibility of constructing the Canal there seems now to be no room for reasonable doubt. It appears to be simply a question of money, and, looking to the facility with which the means for carrying out large undertakings of this class are raised at the present day, it becomes tolerably clear that the project is by no means such a chimera as some of its objectors have supposed. The indomitable M. de Lesseps is fully convinced of the practicability of the scheme, and he has thus far experienced no difficulty in imparting a share of his own confidence to those who can provide the sinews of war. Ample means are forthcoming for the preliminary operations, and these are being actively pushed

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forward. Contracts of considerable magnitude have been entered into for constructing the Colon end of the Canal, a large stock of contractors' plant is being accumulated at various points, and M. de Lesseps assures the shareholders that within the next seven years his scheme will have become an accomplished fact. He contends that the physical difficulties of the undertaking have been greatly exaggerated, that much of what was supposed to be hard rock is found to be soft earth, that the climate is not unhealthy, and that the tradition which places the bones of a Chinaman beneath every sleeper on the Panama Railway is all idle nonsense. Of course some allowance must be made for the naturally roseate views and statements of those who have to induce capitalists to advance the sum of £24,000,000 which the Canal is to cost; but when this has been done there seems to be no ground for regarding the scheme as other than feasible, or for supposing that the completion of the work is a question too remote to call for serious consideration at the present time.

The practicability of M. de Lesseps' scheme is not, however, the question with which this country is immediately concerned. A more serious matter for consideration is to be found in the extraordinary pretensions which have been put forward by the Government of the United States with regard to the control of the Canal when the work has been completed. Certainly these have assumed a somewhat more moderate tone during the last twelve months; but, so far as we can judge from the correspondence which has thus far been made public, the subject is one on which the views of the two Governments are still widely divergent. As a diplomatist Mr. Frelinghuysen is considerably in advance of Mr. Blaine. The tone of this gentleman's remarkable despatch of June, 1881, can hardly be termed conciliatory, or be regarded as likely to lead to a satisfactory solution of a difficult and debateable question. To open the ball by talking in grandiose style of the possessions of the United States on the Pacific coast "*Imperial* in extent and extraordinary in growth"—to completely ignore the Clayton-Bulwer Treaty of 1850, which gave England a voice in the question of an interoceanic canal, and to say that for her to attempt to supplement the treaty made in 1846 between the

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United States and Colombia (formerly New Granada) would necessarily be regarded as "an uncalled-for intrusion," and that any step taken by the European Powers for the purpose of guaranteeing the neutrality of the Canal would be deemed to possess "the nature of an alliance against the United States," was perhaps not the best way of laying the foundation for a mutual and harmonious undertaking. At the time of composing this Despatch Mr. Blaine seems to have been unaware of the existence of the Clayton-Bulwer Treaty. He subsequently became better informed, and both he and his successor in office have addressed themselves to the task of showing the advisability—or rather of pointing out, from the American point of view, the necessity of setting the provisions of this Convention on one side. In November last, Mr. Blaine stated that his Government would not "consent to perpetuate any treaty impeaching its rightful and long-established claim to priority on the American Continent," and that they regarded "the canal question as solely an American one." Mr. Frelinghuysen has adopted a somewhat less defiant tone, and has endeavoured to show that the United States are warranted, by principles of justice as well as by those of expediency, in insisting on the abrogation of the Clayton-Bulwer compact. He contends that England has infringed the contract in question by colonizing Belize in opposition to the agreement that neither party should colonize or fortify in the locality and that, since England has seen fit to set this condition on one side, the United States are fully warranted in regarding the Treaty as altogether void. He further maintains that the arrangement in which England took part in 1850 was made with a view to the possible construction of a Canal by the Nicaragua route, and not by way of Panama, whilst the United States, by virtue of the Treaty with Colombia, guaranteed the route of the Panama Railway from sea to sea. Mr. Frelinghuysen states that,

"Should Her Majesty's Government, after obtaining the consent thereto of the States of Colombia, claim under the Clayton-Bulwer Treaty the right to join the States in the protection of the existing Panama Railway, or any future Panama Canal, the United States would submit that experience has shown that no such joint

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protectorate is requisite, and that the Clayton-Bulwer Treaty is subject to the provisions of the Treaty of 1846 with New Granada while it exists, which Treaty obliges the United States to afford, and secures to it the sole protectorate of any transit by the Panama route. If Great Britain still claimed the right to join in the protectorate, the United States would then determine whether the Treaty stipulations proposed by Great Britain regulating that joint protectorate, were just; and if so, whether the length of time during which Great Britain has recognised the protectorate of the States in Panama under the Treaty with New Granada, has, or has not, relieved the United States from any obligation to accept a proposal from that Government to join in a guarantee."

* * * * *

"The United States esteem themselves competent to refuse to afford their protection jointly with Great Britain, to any other Company than that possessing the original grant from Nicaragua; and they hold themselves free hereafter to protect any interoceanic communication in which they or their citizens may become interested, in such a way as the treaties with local Sovereign Powers may warrant and their interests may require."

There can be no question that Mr. Frelinghuysen is conducting his country's case with much greater skill than was displayed by his predecessor; but the gist of his argument, like that of Mr. Blaine's, amounts simply to the contention that the United States regard the Panama Canal question as one exclusively their own, and that, whatever past Treaties may say on the subject, they do not intend to allow any European Power to have a voice in its future control. The United States cannot think of trusting to any general guarantee of neutrality, but a guarantee by themselves and Colombia is, we are told, an entirely different affair.

That the Clayton-Bulwer Treaty gives England a direct claim to share in the protectorate of the Canal must be plain to any man who understands the English language. But England's claim to consideration in the matter does not rest solely on the wording of the Clayton-Bulwer convention. The value of most treaties is much more apparent than real. They usually retain their efficacy only so long as both the contracting parties are

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willing to abide by them, and it would seem that the case in point forms no exception to the general rule. However, in discussing the issue now at stake, the English Government can afford to leave past arrangements out of the question, if necessary, and base their claim, as the United States seem inclined to do, on the ground of present right and expediency. The States Government appear to think that the extent of their possessions on the Pacific coast warrants them in claiming the entire control of the Panama route, but England is not altogether unjustified in urging considerations of this kind as reasons why she should have a voice in the matter. She too has possessions of considerable importance at various points on the shores of the Pacific and Indian Oceans, and, what is of not less consequence, so far as the Panama route is concerned, it is quite certain that if the Canal were completed, the proportion of British to United States tonnage which would pass through would be about three or four to one.

There are several reasons why the United States should wish to have the complete management of the Panama Canal. As a matter of fact the whole scheme seems to be viewed with a certain amount of disfavour by the eastern and more influential States of the Union. They are naturally unwilling to encourage the construction of a work that threatens to divert a considerable portion of the traffic now passing through their midst, and at the same time to increase the importance of the western States; and if the completion of the Canal depended on their good wishes, the world would probably have to wait a long time before the American continent would be cut in two. Of course these are considerations which cannot be openly avowed, but as there are occasionally wheels within wheels in American politics, it may be that there exists a party who are doing their best to swamp the entire scheme by political embarrassment. This however, is a phase of the question which we need not pause to discuss. The arguments the English Foreign Office have to meet are of a totally different class. The United States Government contend that England's maritime supremacy would render her mistress of the situation, and they wish to correct this by taking prior

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possession of what they think would be a point of great strategic importance in time of war. They contend, moreover, that, even in time of peace, the possession of the Canal would justify them in keeping their naval armament upon a much less extensive scale than would be requisite under a general guarantee of neutrality, and they do not wish to see created any pretext under which European navies could assemble in American waters. The people of the United States seem inclined to cherish the belief that their right to decide all questions of any political importance relating to any portion of the American Continent is plain and indefeasible, and in the claims put forward with respect to the Panama Canal this belief has taken a precise and definite form. It remains to be seen to what extent this impression can be removed, but it must be admitted that, at the present time, the aspect of affairs is somewhat foreboding.

On the grounds of reason and justice the European Powers may reasonably urge that the question is one in which they may ask to be heard. As a matter of right the United States would be as much justified in attempting to control the traffic around Cape Horn as in taking upon themselves the sole management of the Panama route. Their commercial interests in the latter are not involved more deeply than are those of England. Indeed it would not be difficult to show that the case is exactly the reverse. The commercial and direct value to any nation of a waterway through the isthmus would clearly be in proportion to its maritime carrying trade, and in this respect England may fairly claim priority. And, even on political grounds, her stake in the question is not less important than that of the United States. England also has possessions—to use Mr. Blaine's words—"Imperial in extent," if not extraordinary in growth; and to some of these the Panama Canal would be a direct route. Why, therefore, is she to be debarred from taking any part in the matter? If the United States are unwilling to trust any portion of their political interests to a general guarantee of neutrality, surely England is justified in declining to place her interests in the sole keeping of the United States.

It is difficult to reconcile the claims recently put forward by

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the present representatives of the American Government, with the language adopted by those of their predecessors who took any part in dealing with the Panama question. The latter always maintained that the United States by no means wished to usurp any undue advantage with regard to the proposed waterway, and that their main object was to secure similar and equitable treatment for all. Now this has all been changed and, if we may judge from the tone of the published despatches, it seems as though the States have fully determined to take possession of the Canal when made, and to set at nought all claims for consideration coming from this side of the Atlantic. The assertion of the rights of the European Powers will of course devolve almost entirely upon this country, and although the American despatches upon the subject have been addressed to all the principal European States, they are really intended for England only. The results of the Conference which the United States Government proposed should be held between their own representatives, and those of the Central and South American Republics have not yet been made known, but no doubt they will prove quite satisfactory at Washington—much more so, indeed, than they will probably be found in London and Paris. It is perfectly natural that the people of the United States should feel a deep interest in the question of the Panama Canal, but they can hardly expect England to sit quietly by while her stake in the matter is being settled by their Government in conference with the agents of two or three insignificant American republics. Nor can it be allowed that they have any sufficient reason for objecting to a guarantee of neutrality in which the European Powers generally would take part. We imagine that, if three-fourths of the tonnage passing through the Suez Canal belonged to the United States, they would wish to take at least some part in any guarantee that might be formed with respect to its neutrality. If England possessed no mercantile navy of any importance, they would naturally and reasonably object to a proposal that she should shut them quite out of the question, and make an Anglo-Egyptian treaty, which would permit her to seize the Canal and fortify its banks. And this is precisely the position in which we are placed

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with respect to the Panama route. England asks for no pre-eminence in the matter. All she requires is equitable treatment, and unless the American Government have fully determined to set considerations of right and justice totally on one side, it is difficult to see how this can be refused.

THE NEW NAVIGATION.

PRACTICAL RULES FOR THE COMPUTATIONS.

THE *Nautical Magazine* for 1880 contained a series of articles on the value of Sumner's Method of *determining* a ship's position at sea; the opportunity was taken, at the same time, of introducing to the notice of our readers a *new problem* which had recently been investigated by some able French authorities; and we now hear that, from several special qualities this problem possesses, it is getting into very general use among French navigators.

The brief sketch we then gave of the new method of navigation did not admit of our entering into the subject at greater length than to point out the general basis of the investigation, and give the mathematical formulæ by the aid of which the problem is developed. At the request, therefore, of many of our readers we now translate the formulæ into a *verbal rule*, observing, however, that though rules and directions derived from mathematical formulæ are generally long, and oftentimes tedious, we have endeavoured, in the present case, to simplify the subject by the aid of a *blank form* of the computations which the student is advised to look through as he reads the various parts of the rule.

It is unnecessary to reproduce the formulæ; they will be found on pp. 211-212 of our Vol. for 1880.

The problem in its most simple form is this:—Given, on a certain day, A.M. or P.M. at ship, in an *estimated* position (*i.e.* Lat. and Long., both by D.R.), at a given Greenwich Date, mean time (by Chronometer corrected for error and rate), when simultaneous altitudes of two fixed stars have been observed, to determine the

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true position by a comparison of the two true altitudes with two altitudes of the same stars computed for the estimated position?

It is of course understood that all the elements taken from the Nautical Almanac must be corrected for the Greenwich Date. The Sidereal Time (Naut. Al. p. II of the month) will require the *acceleration* for the given Green. mean time to get the Mean Sun's R.A. at the instant of observation. For the Stars, the R.A. and Dec. are given for every ten days, and can be taken out at sight. If a planet be one of the observed objects, the R.A. and Dec. are given under the head of the special planet "mean time" for every day at Green. mean noon, and interpolation will be necessary to reduce those elements to the given Green. Date, mean time.

In stating the Rule the term *star* will be used throughout.—

To find a Star's Hour Angle, or Meridian Distance.

To the Green. Date, M.T. (expressed astronomically) add the Mean Sun's R.A., and from their sum substract the Star's R.A.; the result will be the Star's *Westerly* Hour Angle (or Mer. Dist.) from Greenwich. The Long. (in time) added to this Westerly H.A., if Long. is East,—or subtracted from it, if Long. is West,—will be the Star's Westerly H.A. from the ship's *estimated* position; finally, if the H.A. be greater than 12 hours subtract it from 24 hours for the Easterly H.A., or Mer. Dist.

Note.—In the whole of the above operation, take no heed of the day; and you can reject 24 hours, or borrow 24 hours as necessary.

	d.	h.	m.	s.		h.	m.	s.		h.	m.	s.
Gr. Date, M.T.	..	..	..	..	Sid. T. (N.A. p. II)	..	..	..	Gr. M.T.	..	..	..
					Accel. for Gr. M.T.	+ ..	..	..	Mean Sun's R.A.	..	..	..
		h.	m.	s.								
Star's R.A.		..	..	..	Mean Sun's R.A.	..	..	..	Sid. T. at Gr.	..	..	..
									Star's R.A.	..	..	..
		°	′	″								
Star's Dec.		..	..	..					Star's Hour Angle	..	..	..W*

* To be subtracted from 24 hours, if greater than 12 h., for Hour Angle E.

To compute the Star's Altitude and Azimuth.—

For *Arc* I (or ϕ);—under the Star's Hour Angle write its Dec.; to the log. *cosine* of the H.A. add the log. *cotangent* of the Dec.; the sum will be the log. *tangent* of Arc I or ϕ, which take out, and give it the name of the Dec. (N. or S.) when the H.A. is less than 6h. or 90°, but the contrary name to the Dec. when the H.A is greater than 6h. or 90°.

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For *Arc* II;—under Arc I write the estimated Lat. (N. or S. as the case may be); if both have the same name, take their sum, which will also have the corresponding name; but if Arc I and Lat. have contrary names take their difference, and give the remainder the name of the greater.

For *Arc* III, which is the Star's *Azimuth*;—add together the log. *tangent* of the Star's H.A., the log. *sine* of Arc I, and the log. *secant* of Arc II; the sum of the three logs. will be the log. *tangent* of the Azimuth (Arc III) which take out, and give it the same name (N. or S.) as Arc II if this latter is less than 90°; but the contrary name to Arc II, when this Arc is greater than 90°. The Azimuth will of course be E. or W. as is the Star's Hour Angle.

For *Arc* IV, which is the Star's computed *Altitude*;—to the log. *tangent* of Arc II add the log. *cosine* of Arc III (Azimuth); the sum will be the log. *tangent* of the Altitude, which take out.

Caution.—As all the Arcs are to be taken out less than 90°, be careful in naming them (N. or S.) according to the given precepts.

Note.—A glance at the blank form shows that six openings of the Tables suffice for the computation of both Altitude and Azimuth.

Lastly, under the Star's computed Altitude write its True Altitude as derived from observation, and take their difference, marking the remainder + (*plus*) if the *true* altitude is the greater, but − (*minus*) if it is the less.

Blank Form of Computation.

	° ′ ″				
Star's H. Angle	.. .. ..	cos	.....	tan	.....
Star's Dec. (N. or S.)	.. .. ..	cot	.....		
Arc I or ϕ (N. or S.)	.. .. ..	tan	.....	sin	.....
Estimated Lat. (N. or S.)	.. .. ..				
Arc II—Sum or Diff. (N. or S.)	.. .. ..	tan	.....	sec	.....
		cos	.....	tan	.....
Arc IV—Star's compd. Alt.	.. .. ..	tan	.....		Arc III or Az. (N. or S.) ° .. .. ″ (E. or W.)
Star's True Alt.	.. .. ..				
Diff. of Alts. (+ or −)	.. ..				

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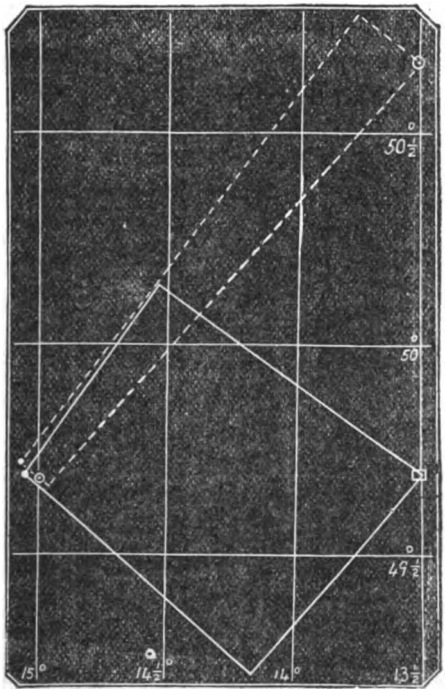
The altitude and azimuth of each star having been computed on the basis given above, it remains to find the difference between the true and computed altitudes of each star, noting whether the true is *greater* or *less* than the computed altitude. This is very important, because, the difference (in miles) when the true is the greater, is to be set off as a distance from the D.R. position in the direction of the azimuth, but when the true is the less, in the direction opposite to the azimuth. From the extremity of each distance set off a perpendicular, and the crossing point of the two perpendiculars fixes the place where the altitudes have been observed, *i.e.*, the latitude and longitude of the ship, nearly.



The two irregular figures (one in plain lines, and the other in dotted lines) on the accompanying woodcut illustrate examples 1 and 2, given below. The actual position in each case was at the circular spot on the meridian of 15°; but the D.R. position was, in both cases, on the meridian of 13½°; one in the Lat. represented by the small square, the other in a higher Lat. represented by the small circle. The woodcut is a reduction from a chart on the scale used at the Board of Trade examinations.

Example 1—1885.—On December 6th at about 6h. 56m. A.M. at ship; the Lat. by Pole star being 49° 40′ N., and Long. by D.R. 18° 30′ W.; when the Chronometer (corrected for error and rate) indicated 7h. 50m. 19s.; an altitude of Regulus was

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observed giving true altitude 46° 38′; and at the same time Arcturus' true altitude was 49° 19′: required the ship's true position.

Gr. Date, M.T. Dec. 5d. 19h. 50m. 19s. :—Mean sun's R.A. 17h. 1m. 3s. :—

Regulus R.A. 10h. 2m. 18s., and Decl. 12° 31′ 21″ N.

Arcturus R.A. 14h. 10m. 26s., Decl. 19° 46′ 40″ N.

Answer.—Regulus' computed Alt. 45° 59′ with Az. S. 42° 32′ W. —gives true Alt. 39′ *greater* than the computed; also Arcturus' computed Alt. 50° 6′ with Az. S. 53° 35′ E.—gives true Alt. 47′ *less* than the computed; from the position (Lat. and Long.) given in the example lay down the azimuthal line of Regulus extending 39 miles; but the azimuthal line of Arcturus trending to North and West (*see* above) and extending 47 miles; from the extremity of these azimuthal lines the perpendiculars will cross in Lat. 49° 41′ N., Long. 15° 1′ W., *i.e.*, within a mile of the position where the true altitudes must have been taken. (*See* plain line fig. on wood-cut.)

Note.—In these computations the Tables have been entered with the nearest quarter minute (′) of arc and the Logs. taken out only to four places; you would not arrive at a nearer result by a more elaborate process.

Example 2.—Take the data and elements of Ex. 1; but using Lat. by D.R. 50° 40′ N., Long. by D.R. 13° 30′ W.

Answer.—Regulus' computed Alt. 45° 14½′ with Az. S. 41° 51′ W., gives true Alt. 1° 23′ = 83′ *greater* than the computed; also Arcturus' computed Alt. 49° 30′ with Az. S. 52° 38′ E., gives true Alt. 11′ *less* than the computed. The azimuthal lines and differences being projected as indicated by the rule the perpendiculars cross in Lat. 49° 42′ N., Long. 15° 4′ W. (*See* dotted line fig. on woodcut.)

In each of these examples the position by D.R. has purposely been given greatly in error, to the end that the value of the problem may be better appreciated. It may indeed be said that if the time at ship be moderately well kept, and properly corrected for the estimated change of meridian, the problem will serve as a valuable check on the chronometer, using the ship time and D.R.

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elements; and where the chronometer has broken down, a ship might safely be navigated by the new method.

The problem admits of the position being finally determined by the aid of the Traverse Tables, but this method is not preferable to that by projection on a chart of a large scale.

THE SUEZ CANAL AND THE EUPHRATES VALLEY RAILWAY.

REMOVING a neighbour's landmark is numbered among the nine special sins denounced in our very charitable Commination Service, and no few honest thinkers, puzzled to explain the existence of somewhat similar sentiments in the Bible itself, have gone so far as to assert that allusion is made to achievements like the Suez and Panama Canals, which certainly do alter the natural face of the land, and completely obliterate our neighbour's landmarks. There assuredly is something approaching the impious in the French suggestion to turn the lower levels of the desert into a vast inland sea, while the notion of converting South America into an island proves equally unseemly in certain quarters. But pessimists of this school evidently belong to a class akin to those "stay-where-you-are" politicians of a former day, who for similar reasons first denounced roads into an enemy's country, and subsequently raised a hue and cry against railways. Happily most likely for the world, science takes no notice of these perennial croakings, nor of the constant attempts made by bigotry to enslave her. Having grown accustomed to them from long acquaintance she heeds them not in the slightest, pursuing unabated the even tenor of her course towards perfection. Those who love progress and those who do not must accept matters as they are, and expect in the future still greater effacements of existing geographical distinctions. Nevertheless, it must be conceded in fairness that each mundane alteration made in Dame Nature's map is the occasion for strife among the nations, and it is too much to hope that the Suez Canal will escape the hateful fate which for some occult

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reason has dogged the steps of science throughout all ages. M. de Lesseps' handiwork has become a new bone of contention which it seems likely may be fought for by the European nations with even more bitterness than Gibraltar ever was in the past. Already it has led to the shedding of blood, although by a happy diplomatic fiction we are not supposed to be at war with any one, and before the century closes it may, probably will, lead to fresh and important changes in the geography of Europe. Moreover, and what is equally consequential from our point of view, it may bring around considerable alterations in the respective commercial positions of the leading European Powers. It is this problem we desire first to consider.

Those States who have an outlet on the Mediterranean Sea are now several days nearer the East than ourselves, and by right of that newly-gained advantage possess a *natural* trade interest in India and China at least equal, if not superior, to our own. Since Count Ferdinand de Lesseps' waterway was opened, France, Italy, Austria, and Russia, have alike paid growing attention to Eastern affairs. One and all have started direct steamship communication with various ports in the Orient; each, it appears, is daily adding to its mercantile fleet; nor does it seem unreasonable to anticipate that as time grows older these great nations, and possibly Spain and Greece also, will increasingly supply their own shipping wants in the East, instead of largely employing British bottoms as now. In each country a revolution has commenced in favour of home service, and if the Suez Canal remains permanently open, we shall doubtless see constant large additions made to their Mercantile Marines with comparative stagnation at home. Not that the British shipping engaged in the Occidental and Oriental trades is likely to show any signs of diminution—far otherwise. Commerce is rapidly growing between England and India, and between England and Australia; nor is there any pressing danger of a decline in our trade with China. Our commerce with the Eastern world is bound to grow apace, so long as we maintain the integrity of our world-wide Empire; but whereas the annual augmentations to our mercantile fleet will be gradually progressive, the additions made to those of foreign nations will, for some time

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to come at least, be by leaps and bounds. To otherwise put it—our excessive preponderance will steadily pass away. Anyone who has closely followed the fortunes of the Messageries Maritimes, Rubattino and Austrian Lloyds lines during the past few years will know that these pessimist forebodings are not absolutely uncalled for. Even Russia, with a capital overland route to China, has found it worth her while to start a direct line of steamers between Odessa and Hankow, threatening our tea ships with the loss of a most lucrative branch of transport. Let optimists say what they like, there is, unhappily, only too much reason for our misgivings, and this everyone may observe for himself by glancing over the files of that well-compiled Parisian shipping journal, *L'Indicateur Maritime Universel*, which gives particulars of the chief mercantile fleets of every nation engaged in the foreign trade. In its columns we can trace the progressive history of each company. Those who have not noted the doings of the Messageries Maritimes and Rubattino Companies will find therein ample matter for quiet reflection, possibly of a not over pleasant character. Until the Suez Canal was dug neither of these Companies had a vessel employed in the Eastern trade; to-day both possess fleets of considerable magnitude, to which additions are being made, so to say, daily. Can this revolution be deemed advantageous to England? We fear not, despite the glee evidently felt by certain daily journals at this country owning four-fifths of the shipping passing Suez. So far as we can see there is little significance in the fact, and that little, if either way, counts against us. It certainly affords no occasion for rejoicing, or for the singing of triumphal pæans, as until the opening of the Canal, and while commerce had to round the Cape, English steamers were alone seen in Eastern waters. Twelve years ago neither France, Italy, Austria, nor Russia ran a single steamer between the Mediterranean and the Indian Ocean; whereas now the vessels of their steam fleets are both numerous and powerful. Why this should be regarded as a triumph of British enterprise we confess our inability to see, for, had not the Suez route been opened, it is very doubtful whether a single foreign steamer would yet have found its way to Bombay, Point de Galle, Singapore or Hong Kong.

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Unquestionably the chief feature in the near future will consist in the revivification of French commerce with the East. Possessing a magnificent seaboard, with several good harbours along the Mediterranean, and an almost complete railway system, our enterprising neighbours are sure to avail themselves to the very utmost of their splendid good fortune. Being many days' passage nearer Port Said than the nearest English ports, namely, Plymouth or Southampton, and having as well at command unusual facilities for inland communication, they would be the next thing to insane to continue sending goods to England for transhipment, or to further employ British shipping in the traffic between Bombay and Port Said. Trade between France and the East is much larger than is generally supposed, incomparably larger than is revealed by any *primâ facie* examination of trade statistics. From China alone the French import annually several million pounds' worth of raw silk, but a portion only of this commerce is entered in their Board of Trade Returns. Considerable quantities are still shipped in English bottoms, despite the fact that nine-tenths of the silk factories are located in the south, mostly around Lyons. Northern France still obtains *viâ* England a material proportion of such Oriental wares as she consumes—a negation of common-sense and all economic laws of distribution that must find a speedy ending, now that French shipowners are learning to appreciate the general advantages accruing to Marseilles through its central position. Is it reasonable to suppose that Parisians will wait a week or more for goods to travel to England first, when a few hours' railway ride will carry them from Marseilles to Paris? The world is not quite so mad as all this, and Frenchmen above all people are qualified to take care of their own interests, whether commercial or political. That our trade has not been cut to pieces already is solely due to the intense selfishness; to the unutterable short-sightedness and folly of the French railway companies, who have never afforded merchants the least encouragement. To their prohibitory charges, more than to anything else, we owe the continuance of our maritime supremacy; but signs are not wanting to tell us that, although

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somewhat late in the day, these unpatriotic bodies are at length beginning to understand in what direction lies their best hope of future prosperity. By lowering freights they are now seeking to divert French commerce with the East to the Marseilles route, and according to a recent statement, their efforts are meeting with a fair measure of success.

Probably enough this change of policy on the part of the Great Southern of France, the Paris and Lyons, and other railways is due to no more exalted motives than self-protection. By the opening of the St. Gothard tunnel a new route has been opened for goods to reach western France, and it may be that this threatened competition has led the French companies to reconsider their position. The same cause is unquestionably diverting traffic to the Antwerp route, and is also likely enough to affect French railways in the direction suggested. Moreover, the Arlberg tunnel is rapidly drawing to completion. When it is opened (which will be at no very distant date) both the west and north of France are bound to be extensively supplied through Lombardy and Switzerland, and to counteract this new competition we may rely upon it that freights for merchandise and passengers will be again reduced on all the lines connecting Marseilles with Lyons, Dijon, and Paris.

Each reduction in charges made by these railway companies will lead to an increase in the Mercantile Marines of France, Austria and Italy, and add to the importance of Port Said and Suez in the eyes of all European nations. Already, commerce between the East and West has been largely diverted from its ancient route round the Cape of Good Hope, and, through the rapid supercession of sailing vessels by the colossal high-speeded steamers of this era, seems destined to desert it almost entirely; especially, if as looks probable, railway freights on the Continent are generally lowered. Time is a factor that has to be allowed for when solving any trade problem, and granting that the companies reduce their tariffs so as to compete with English shipowners, and work in concert with the steamship lines managed by their countrymen, the world will witness another great trade revolution from which English shipping interests will seriously suffer.

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In the event of M. de Lesseps' Canal being permanently kept open and maintaining its present position as England's road to India, there can be no doubt but that a large and increasing share of prosperity will fall to the lot of Marseilles, Genoa, Venice, Trieste, Brindisi and other Mediterranean ports; indeed one or more of them in time is likely to rival Liverpool or Glasgow in commercial grandeur; possibly may far surpass either of those great shipping centres. Having Western Europe, with its enormous population, as a market for the products of the Orient, and *vice versâ* having the entire East to supply with the manufactures of Europe, there seems no positive counter reason why the more fortunate and flourishing amongst the southern outlets should not ultimately grow as rich, as well populated, and as important as Berlin, Brussels or Paris; or, for the matter of that, as vast as London itself. At present, of course, it would be mere waste of energy to attempt to prophecy which towns will fall upon evil days and languish away into insignificance, or which will leave their indelible marks upon the pages of history, civilisation and commerce. Such rises and such decadences are almost entirely dependent upon national enterprise and the idiosyncracies of trade; nevertheless, it requires no Merlin-like gifts to see that Venice and Genoa will again emulate their glorious past, or that Marseilles, Triesto, Brindisi and Salonica will be numbered among the great cities of the future.

One point, however, must not be overlooked in any enquiry into the commercial or strategic influence of the Suez Canal. It is ever liable to be seized by some one of the Great Powers and closed to commerce for a time—perhaps for months or years should England and France again come to blows. Both have important interests in the East to defend, equally to be attacked; and as of old the battle for supremacy would be partly fought out in the Indian and Chinese Seas. In that eventuality the nation obtaining the Suez Canal would reap an immeasurable advantage. Indeed, its possession would half win the battle. Neutralisation is proposed under the joint guardianship of that sublimely impotent mental creation, the European Concert. But all efforts in this direction must prove futile, mere vanities of vanities, as in times of war

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treaties and conventions are very apt to go the way of all flesh. France and Italy, if not several other of the Powers, favour the neutrality proposition, probably foreseeing that sooner or later it may operate to embarrass England's military action, while strange to say not a few shipowners in this country are numbered among its adherents. However, it is very doubtful whether the latter have given any deep consideration to the problem, for if they had they would probably have found out by this time that the suggestion is chimerical to a degree. As the *Temps* very properly points out, there is something childish about the scheme from beginning to end. Seeing that in one day England seized the Canal along its whole length, while unprepared Europe looked on in amazement, it is mere waste of breath to talk about securing by a European Convention its free passage for ships of commerce. Moreover, it is impossible that English diplomacy can be beguiled by so flimsy a pretence. Every statesman in this country understands that the foreign cry for neutrality is only a fresh attempt on the part of Europe to stay the hand of England and cripple her future power for good or evil in Asia. Besides, if any such Convention was signed at all, reservations about *force majeure* would necessarily have to be inserted, and this plea can always be put forward to countenance military operations undertaken contrary to the spirit, if not to the letter, of international compacts. No belligerent can conscientiously carry out its engagements with other nations. Circumstances are always arising for which no previous provision was or could have been made, and, besides, when the war path is being trod military necessities are paramount to all other considerations. Let England be at war with France, Italy, Russia, or any other Power and no Convention would prevent them trying to aim a vital blow at her in the plains of the Egyptian Delta. The instrument would then become a mere piece of waste paper. So long as the waterway between Port Said and Suez continues as now to be England's highway to the East, so long will Egypt be her battle-field, and if in time of war she does not herself seize the Canal other nations will.

In the next place the Egyptian race is always liable to "kick

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against the pricks;" in other words, to rebel against the European control, and at no time more likely than when we are involved in an imbroglio with one of the Mediterranean Powers. At any moment a popular movement might end in dethroning the reigning Khedive and in the seizure of the Canal. Treachery is always to be feared when dealing with Asiatic races, and unfortunately for us unfriendly counsels are often tendered to them by our disguised foes. If left undefended as now the Canal could be seized and closed against us long before we received notice of any such intention, while supposing that at the same time our relations were greatly strained with France or Italy, a flying expedition emerging from Toulon or any other great naval dockyard on the Mediterranean, might cross unperceived to Port Said and successfully bar our road. The only ways to guard against this prospective danger are to double our Mediterranean fleet, to convert Cyprus into a place of arms, and to employ a large number of cruisers in these waters; or to construct an alternative route, and render ourselves somewhat independent of the modern Gibraltar.

Neutralising the Canal will not safeguard our interests in the least: it will only bring us into graver dangers and hasten the day when its possession will be fought for among the European lions. Nor do the patrons of the scheme seem themselves to have any distinct notion as to what the word means or how their plan is to be put into operation. In what possible way can the Canal be neutralised? It certainly is not proposed to prohibit the passage of ships of war during times of peace. If so, Europe might as well at once surrender Asia to the Asiatics. In these days of superlative weapons every European in Asia might be massacred long before aid could arrive round the Cape. No nation, least of all England, would consent to forego the advantage of rapid communication between the different sections of its Empire, while in times of war it is quite certain the provisions of any agreement would be disregarded by the belligerents. If France was at war with England her military policy would be inevitably directed to blocking the Canal against us, while her emissaries stirred up insurrection in India. The only possible result of a European convention with

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regard to the passage of the Canal would be to lull us into a sleep of false security, out of which we might be rudely awakened when too late.

Sir William Andrew and many other Anglo-Indian authorities throw forward as a remedy the construction of a railway through the Euphrates Valley, from Alexandretta in the Bay of Iskenderoon, to Grain at the head of the Persian Gulf; and I take it as assured that among the more important outcomes of passing events in Egypt will be the construction of that railway under State guarantee, or something very much akin to a guarantee. The distance between the two places above mentioned is estimated at about 920 miles, and as the line would traverse a flat country devoid of any serious engineering difficulties the capital required would be comparatively small. Knowing at what price railways have been laid in America and India the estimate of £7,500 a-mile does not seemingly err on the side of minimisation. At this rate a capital of about eight millions would suffice to construct the line, including stations and plant, and upon this sum dividend earning should not be impossible. In the worst case a guarantee of 4 per cent. interest would only cost Government the inconsiderable sum of £320,000 per annum, compared with which the political advantages to be obtained are immeasurably more consequential; indeed cannot be weighed in the same balance. Besides which, the saving of seven days in the passage to India, would enable Government to effect several economies in administration, and in all probability to more than save the actual outlay. About the strategic advantage of a quick alternative route which would make us to some extent independent of the Canal there can be no two questions. It would enable us to govern India twice as efficiently and ten times more safely than at present, while it would do more than anything else to secure the peace of Europe. Egypt and the Suez Canal would then lose much of their political significance, and it might be possible for Continental nations—then no longer jealous of England—to come to look upon the Canal in the light of a commercial water way only. Of course we should take upon ourselves the material as well as the moral protection of Turkey in Asia, and this would

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mean fighting the Sultan's battles for him. This, however, might be to our advantage. It would secure the independence of the Turkish Empire and seriously check, if not put an end to Russian encroachments in that quarter.

The moment peace is assured in the Delta, and friendly relations are again set up with the wily Sultan, negociations it is to be hoped will be opened up with a view to obtaining the indispensable concession from the sovereign ruler of Syria and Mesopotamia. If already in train they will have been commenced not one moment too soon. France has ever studied to exercise an influence in Syria, and if French capital or French enterprise is directed to this undertaking, we shall at some future day experience just the same trouble that we are now undergoing at Suez. Syria must not be allowed to pass under the protection of our ever sore and jealous neighbour, nor to become to all intents and purposes one of her outlying provinces. Lying almost in the direct road between Great Britain and India, our interests therein are too important to be neglected, even in times when weightier matters are pressing.

While on this point it may be pardonable to express the hope that negociations will also be opened up with the Shah of Persia for the right to construct a line connecting Kurrachee with Bassorah on the river Euphrates. English statesmanship should not overlook the fact that Russian money is rapidly pushing a system of railways through Persia to the head of the Persian Gulf. When these lines are completed, the dream of a British railway between the Mediterranean Sea and India will be plainly impossible.

This, however, is not the proper time or place to discuss these problems, nor is it the place to try and unravel the equally interesting and still moot problem as to where the railway should start from. Alexandretta, Seleucia, Latakia and a dozen other points on the Syrian coast have been named. Each possesses its separate commercial and political advantages, and each is subject to its particular disadvantages. Alexandretta has generally met with the preference; first, because of the natural shelter afforded to vessels through the magnificent Bay of Iskenderoon; and, next, because it lies in a direct line with the Bosphorus and Constanti-

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nople, to which city the framers of the scheme hope ultimately to continue the line. What we wish to consider mostly is the probable effect that its construction will exercise upon British shipping and how far it will affect the Suez Canal.

From a strategic aspect Suez would lose half or more of its present significance, and this could only result in a gain to commerce. With the railway in existence the Canal would no longer constitute our chief military road to India in time of trouble, troops being so much more readily and more expeditiously forwarded by rail: it would consequently cease in part to be a menace to the peace of Europe. The enmity of Europe would then centre in Mesopotamia instead of the Delta as now; while the Canal to some extent at least would be surrendered to the cause of humanity, progress, and commerce. To neutralise it then would be no such impossible task, for the Euphrates railway would serve England's military needs in times both of war and peace, and those of other nations in times of peace alone. Having comparatively small interests in the East to serve other nations might then consent to shut against their war ships the short cut to the Red Sea. That the railway would abstract any large share of the commerce now passing through the Canal is an argument finding no echo in the writer's mind. Some proportion of through traffic, especially light goods and those liable to spoil by long keeping, would doubtless pass over the line; but it happens that economy is the chief *desideratum* which merchants have to consider, and the cost of double transhipment, together with the high freight charges entailed by a 900 miles railway journey, would more than eat up, I fear, any saving that might be effected by taking the shorter sea voyage up the Persian Gulf. Lesseps' Strait would convey just as much shipping between the Mediterranean and Red Seas, though the Company might lose some share of its prosperity in being compelled to lower its excessive tolls. This, however, would prove a general gain to the commercial world, not a loss, though the de Lesseps family might think differently.

Among other probable consequences there can be little doubt that Kurrachee would become the military port of India and in the course of years rival Bombay in magnificence; while regular steam

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communication would be established between those towns and Grain. Cyprus, of necessity, would be converted into our chief *placę d'armes* in the Mediterranean, and upon it we should have to maintain a considerable army, supported by a fleet of powerful ironclads; while Alexandretta, or Latakia, or whatever other town the line started from, would leave its ineffaceable mark upon the history of commerce and might be expected in time to revive the glories of the Syrian cities of old.

Finally, there seems no cause to imagine that the construction of a line through the Euphrates Valley will exercise a detrimental effect upon our shipowning interests. It is more likely to impart a new stimulus to them. Fresh lines of steamers will have to be run between Grain and Kurrachee or Bombay; while a new and important port will be opened on the Mediterranean. Only good apparently can result to British commerce from the threatened competition with the Suez Canal Company; and, if that ill-disposed and selfish body experiences some amount of harm, no one but its constituent members will have any occasion for moaning.

F. N. NEWCOME.

MERCHANT SHIPS IN THE WAR.

A FEW weeks ago our ironclad fleet, built and equipped at such great cost and which has been the subject of so much debate among sailors and naval architects, was put to its first practical test in the bombardment of the forts at Alexandria. We might enlarge upon the many contrasts between the modern ironclad and the old wooden liners with which we entered into the last war in which ships took any part, but they may be summed up in the statement that the war-ship of the present day has come to be a mere fighting machine, and the more efficient she is in that respect, the less is she fit for anything else. The largest ship of the Baltic fleet carried 130 guns and 1,100 men, the most powerful ironclad at Alexandria 4 guns and 450 men. In the old wars the liners and frigates could

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spare a large force for action on shore, and could carry, if need be, many troops in addition to their own large crews. The Royal Navy of the present day is essentially a fighting navy, and every successive emergency finds the Government more and more dependent for other services upon the Mercantile Marine. There are, it is true, a number of troopships sufficient for the duty of relieving the garrisons of colonial stations, conspicuous among them being the five large Indian troopers which are kept going between Portsmouth and Bombay; but for the transport of a large expedition the Government is compelled to trust mainly to merchant steamers. How well they may trust to such help is shown by the fact that over sixty vessels in England, and half that number in India, were with no difficulty at once obtained, and furnished the means of transporting a force of some thirty thousand men, with the necessary horses and stores, and that, too, without inflicting any apparent inconvenience upon the ordinary business in which the great companies are engaged, from whose lines most of the steamers were drawn. Within a month from the time when the expedition was planned nearly all the troops required are at the seat of war, fourteen days' voyage from England.

We have in former articles dealt at length with the important question of the applicability of our large merchant steamers for actual fighting purposes; of their immense value for transport there has never been any serious question. We have now had practical proof of the readiness with which a large number of them can be obtained to meet an emergency, and we doubt not that if the more difficult and dangerous employment had been necessary, ships and officers and crews would have been obtained with equal facility.

The present war is notable for the almost exclusive employment of merchant vessels in the conveyance of troops; they have always been used for that purpose, and it may be of some interest for us to refer briefly to the usual conditions and character of their employment by the Transport Department of the Admiralty, which is interested with the duty of the conveyance of troops and war material.

The term *transport* is employed by the Admiralty as the official

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designation of a merchant ship wholly engaged by them, vessels in which conveyance is merely engaged for a number of troops being known as troop-freight ships. When tenders are invited for transports only steamers actually in port or expected at an early and fixed date are admissible, and they must be under the British flag. They must have not less than 6 ft. height from deck to beam between-decks, and if required for horses the 'tween-decks where the horses are to be carried must be 7 ft. in the clear. Tenders are sent in upon forms in which must be stated, among other particulars, the average speed of the ship, the number of days coal space in bunkers, and the dimensions of all the spaces between-decks. The tender must also state the price per ton per month at which the steamer is offered. The tonnage upon which the hire is paid is the gross register tonnage of the steamer. The price at which the vessels would be offered would obviously vary to some extent with their speed and general character. We believe in the tenders accepted on the present occasion the rates vary from sixteen shillings per month, for some vessels only taken as store-ships, to twenty-seven shillings and sixpence, which is the rate at which the splendid steamer *Orient*, of the Orient Company's Line was engaged for four months certain. If the vessel is engaged for four months, two months' pay is advanced, if for less, one month's pay is advanced.

The rate paid by the Admiralty is merely for the use of the ship complete and ready for sea, and for the services of the master and crew; transport ships are not subject to port charges, and expenses of pilotage are paid by the Admiralty. Provisions for the crew have to be provided by the owners, who also have to provide water for all on board, but coal used for the propulsion of the ship and for cooking, &c., for the troops is paid for by the Government. The owners of ships are required to provide at their own expense for any necessary additional ventilation and increased hatchway accommodation, and have also to re-arrange cabins or bulkheads where required. The Government bear the expense of fittings necessary for the accommodation of horses and of troops, it being the practice to use the existing cabin accommodation for officers and to fit up mess tables and sling hammocks

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for the troops. Owners of ships used as transports may be required to victual the troops and provide forage at a fixed tariff.

The Admiralty take upon themselves in their engagements with transports special war risks, that is if the vessel is by the enemy burnt, sunk, or captured, they pay her value to the owners provided that her loss was not occasioned by any fault or neglect on the part of the master and crew, and that they made the utmost defence possible. If, however, a vessel is driven ashore by stress of weather or accident, and is there captured by the enemy, the Government do not compensate her owners for her loss. It is hence important for owners of transports to take care that their insurance policies cover just those risks which are not met by their agreement with the Admiralty. The value of each ship is fixed by the Admiralty officers when she is first engaged, and that value is the basis of the compensation in the event of her loss.

Although the transports for the Egyptian expedition have been fitted and got to sea in really a very short time, it is perhaps worth considering whether the time might not have been still further shortened by utilising to a larger extent the existing fittings on board many merchant steamers, instead of pulling them down and putting up fresh ones of the Admiralty pattern. It may be asked, for instance, could not the berths for steerage passengers be used for troops, could not cattle fittings be adapted for horses; if such could be done how many days might be saved. We do not think very much could be done in either respect, the fittings for troops are of a very simple character and take but little time in construction, consisting as they do of a simple mess table and stools and hammocks, the latter being kept in stock and only requiring hooks to be fixed for their support. Nor does it appear practicable to utilise cattle fittings for horses, the nature of horse transport at sea being so essentially different that an entirely different provision has to be made for it. We do think, however, that the Admiralty authorities might learn much of the Mercantile Marine in this respect. Valuable, and in many cases, very large horses are exported for breeding purposes in considerable numbers, and a comparison which we have been able to make between the

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usual provision made for them in our large merchant steamers, with that made for horses in transports, shows that in efficiency, rapidity of construction and economy, both of labour and material, the official arrangements are much inferior to those usually adopted in the Mercantile Marine. The scantlings of the Admiralty fittings appear absurdly large, and they are so abundantly fastened to the decks of the ship that their removal must be an expensive operation.

Transports are known officially by a number which is assigned to each on engagement. A white patch, 8 feet long by 4½ feet deep, has to be painted on each bow and quarter, and on these are marked the number in black figures, each figure being three feet long.

Several of the more important companies are represented in the merchant steamers engaged by the Government as transports at present. The vessel which has perhaps attracted most attention is the *Orient*, which left the Royal Albert Dock, London, on the 30th July, and arrived at Alexandria on the 10th August, thus making the passage in eleven days. She carried the staff of the 1st Division, including H.R.H. the Duke of Cannaught, and was mainly freighted with the 1st Battalion of Scots Guards, numbering over 700 men, and being accompanied by 110 horses for the officers and for baggage. The *Orient* attracted much attention some time since when she arrived in London from the Clyde for the Australian service of the Orient Line; but she has since been eclipsed by the *Austral* of the same Company. Her gross tonnage is 5,386, and nominal horse-power 1,000.

The *Carthage*, of 5,100 tons gross, is a recent addition to the fleet of the Peninsular and Oriental Company, whose connection with the Government is of very old date. She is the hospital ship of the expedition, and her roomy decks, and especially her large promenade upon the hurricane deck, which is 300 feet long, justify her choice for that purpose. The *Calabria*, which took out Sir Garnet Wolseley and the 2nd Life Guards, was employed in cavalry transport during the late South African wars, as were also some vessels of the National Line, which on this occasion has furnished three ships, the *Greece*, *Holland*, and *Italy*. Two

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notable vessels engaged are the *Ludgate Hill* and *Tower Hill*, of about 4,000 tons each, the largest twin-screw steamers in the Mercantile Marine.

The *Catalonia*, of 4,841 tons, which took out the 50th Regiment and a number of officers is a recent addition to the Cunard Line, and has been built for their Boston trade. She is not a fast ship, but is equal to 13 knots, and her spacious 'tween-decks well qualify her for a transport.

It is said that the thirty steamers engaged in the first instance by the Indian Government as transports are of an aggregate gross tonnage of 54,061, and their total pay is 17 laks of rupees per month. This would be an average rate of about 52 shillings per ton.

The following is a complete list of steamers chartered during July and August for conveying troops, stores, &c., to Egypt from the United Kingdom:—

The Orient Line supply the *Orient* and *Lusitania;* the Monarch Line, the *Egyptian Monarch* and *Assyrian Monarch;* Messrs. Donald Currie and Co., the *Dunrobin Castle* and *Courland;* the Inman Line, the *City of Paris* and *City of New York;* the Cunard Line, the *Palmyra*, *Batavia*, *Catalonia*, and *Marathon;* the Allan Line, the *Caspian*, *Austrian*, *Grecian*, *Prussian*, and *Canadian;* the National Line, the *Holland*, *France*, *Italy*, and *Greece;* the Dominion Line, the *Montreal* and *Texas;* the Peninsular and Oriental Company, the *Carthage* and *Nepaul;* the West India and Pacific Company, the *Californian* and *Bolivar*. The names of the other transports are: *St. Ronans*, *Nerissa*, *Rhosina*, *Maulkins Tower*, *Dacca*, *Nyanza*, *Tagus*, *Juan*, *Lisbon*, *North Britain*, *Storm Queen*, *Osprey*, *Calabria*, *Surprise*, *Viking*, *City of Lincoln*, *Tower Hill*, *Ludgate Hill*, *Pelican*, *Olympus*, *Lake Huron*, *Lucerne*, *Nevada*, *Ascalon*, *Irthington*, *Iberia*, *Oxenholme*, *Whitley*, *Teviot*, *Odessa*, *Cadiz*, *Recovery*, *Stormcock* (tug), *Blenheim*, *Arab*, *Capella*, *Neera*, *Atlantic*, *British Prince*, *Verona*, *Rewa*, *Duke of Argyll*, *Adjutant*, *Lechmere*, *Stelling*, *Amethyst*, *Dabeattie*, *Empress* and *Navarino*.

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SAYA DE MALHA BANK, SOUTH INDIAN OCEAN.

THIS extensive bank lies between the latitudes of 8° 16′ and 11° 46′ S., and the longitudes of 59° 37′ E. and 62° 16′ E. It has a length of 234 miles in a north-north-west and south-south-east direction, with a breadth varying from 20 miles in the northern portion, to 120 miles in the southern.

The northern portion is about 75 miles long, north and south, with a width in the centre of 23 miles, with apparently a deep-water channel about 20 miles wide to the southward, between it and the main body of the bank.

This northern bank is steep-to; the eastern edge, with from 6 to 12 fathoms, rising abruptly from the ocean. From the eastern edge the bank gradually deepens towards the western, to 20 and 30 fathoms, falling suddenly into deep water; bottom was not obtained within two miles of the western edge with 130 and 200 fathoms of line. Six miles eastward of the bank, bottom was not reached with 500 fathoms of line. The apparent north end where the bank is about 2 miles across, with 12 fathoms, lies in lat. 8° 18′ S., long 60° 6′ E., two miles north-east of which position, bottom was not reached with 225 fathoms of line.

Shoal Ground.*—The shoalest water found was 5 fathoms, near the eastern edge of the northern portion of the bank, in lat. 9° 12′ S., long 60° 21′ E., with about 10 fathoms for 16 miles to the south-westward, dropping suddenly into no bottom with 220 fathoms. North-eastward of the 5 fathoms, for a distance of 6 miles, there is a general depth of 10 fathoms, with no bottom at 500 fathoms 13 miles distant.

Nature of Bottom.—From the soundings obtained, the nature of the bottom appears to be coral to a depth of about 33 fathoms, and in deeper water to be composed of fine sand. H.M.S. *Fawn*

* On the southern portion of the Saya de Malha bank, in about lat. 11° S., there are some coral patches of 4 fathoms or less, on one of which it is said the French schooner *Eliza* was in some danger, and the same depth has also been reported on the northern portion.

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anchored in 14 fathoms in lat. 9° 53′ S., long. 60° 51′ E., riding easily with 100 fathoms of cable, though there was occasionally a chopping sea. Also in lat. 8° 25′ S., long. 60° 10′ E., in 11 fathoms. Here the bank is only 5 miles broad, dropping suddenly to the westward from 17 to 125 fathoms.

Current.—From observations taken when at anchor, and during surveying operations, the mean direction of the current was found to be a little southward of West, with an average strength of one knot per hour. In the many channels of deeper water between the shoaler parts of the bank, the current is variable, and runs with increased velocity, but over the shallow parts the strength is much diminished.

Tide Rips.—North-westward of the bank, in lat. 7° 45′ S., long. 59° 40′ E., heavy tide rips and one overfall were observed, probably caused by the meeting of the current from the opposite sides of the bank; bottom was not obtained with 230, 180, and 214 fathoms of line.

Reported Breakers.—In the assigned position of "reported breakers," lat. 7° 15′ S., long. 61° 26′ E., no broken water was observed, and bottom was not obtained with 350 fathoms of line.

Reported Shoal.—Search was made for the shoal reported to exist in lat. 12° 12′ S., long. 60° 42′ E. (approx.), but bottom was not obtained with 450 fathoms of line.

Bearings Magnetic. Variation, 5° W.

CORRESPONDENCE.

"LYING-TO IN A GALE OF WIND."

To the Editor of the "Nautical Magazine."

Sir,—I shall endeavour to describe this manœuvre under its different heads, and without prejudice to any previous remarks that have been written on the subject.

"Let every man enjoy his own opinion and use his own judgment," for no two ships will behave under all circumstances exactly alike, nor the same ship perhaps in two different cases be exactly herself. There are various causes which explain this, *e.g.*, difference

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of trim; cargo and its distribution; depth or draught of water, &c; still the principle of handling and necessary precautions required remain the same. To avoid danger to that part of the ship "the hull," from the action of the waves, the management, I maintain, is pretty much the same in sail and steam in all cases, therefore, *I* make no distinction of principle in either class of vessel when manageable; for in cases of accident, when sails are lost or machinery disabled, and ship becomes unmanageable, the only remedy is to do whatever is practicable for the general safety.

1st. What in nautical phraseology is the meaning of being "*hove-to*," as well as under what circumstances does this become necessary?

The answer to this, I think, is the same now as ever, even for both classes of ships, sail or steam, viz., from necessity. When the combined elements, wind and sea, make it unsafe to reach, carry sail, or keep up speed, the ship is then put in such a position as she will lie easiest, offering as little resistance as possible to avoid straining, at same time having sufficient pressure on "steam or sail" (acting with the *helm fixed, not steering*), to keep in position and avoid being driven as much as possible out of her proper course. Thus laid, a square-rigged ship will keep to within about 5½ to 7½ points of the wind, average range 2 points; with fore-and-aft sail much nearer the wind. This range with the drift gives steerage power to the helm, small but sufficient to act; that is, a ship when hove-to is not under what is called steerage way; when a ship can be managed by her helm, she is, or must be, sailing or steaming to give the helm that commanding power over her movements.

2nd. In sailing when close-hauled, or in steaming head to sea, the position is easily attained, I mean the bringing-to is done, nothing being required but reducing the pressure for speed, sail or steam.

3rd. When running, the necessity for heaving-to may arise from several causes, such as bad steering, insufficient power to clear the sea, especially in deeply laden ships; for in many cases the gale might be so severe as to make it impossible to carry sail on the sailer, or sail to assist the steamer to keep up sufficient speed, or although it might be blowing hard, the sea often is, or seems to be, higher and running faster than might be expected from the force

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of the wind, as though there were more wind in the rear; be the cause what it may, when the ship cannot run to clear the sea, to avoid being pooped, and having everything swept off deck, she is rounded-to, in which manœuvre too much judgment and caution cannot be displayed. When to, of course adopt the former plan, with sail, steam and helm, to keep her as steady and quiet as possible.

Having said this much, and given reasons for laying a ship *bow to*, let us review impartially the opposite method, "keep the quarter to the sea." In the July number, *Nautical Magazine*, p. 520, a letter appeared in answer to one in the March number, p. 197 on this subject, and which might be termed "bow *versus* quarter."

In this present one let us go somewhat more into detail, beginning with a comparison of the two systems, through a letter advocating the quarter system which appeared in the May number, p. 360. The writer says he hove-to, *i.e.*, "stopped engines, double-reefed fore-trysail, set-headyards, braced up-helm hard-a-weather. The ship settled to this, keeping the wind from two to three points abaft the beam; she rode like a duck, rolled very little, and strained less. Drift two to three knots an hour." This is a very simple, lucid illustration of what was done, giving his reasons for adopting the system; one thing seems to have influenced the writer, viz., "the shape of the hull, no fore-foot or gripe, and being heavier rigged forward, all would have a tendency to carry a ship off from the wind." All this with a ship going from two to three knots with the helm hard-a-weather. Query, was there not danger of the ship heaving round? more especially when the description of the stern is taken into account, "with the propeller acting as a drogue."

To wear a ship, the rule is, I might say, absolute. "Reduce all direct force aft, even to backing mizen sails," which would act as the drogue. However, she did not wear, "and the gale was furious, with high topping seas, and she laid steady with reefed trysail and helm, keeping wind from two to three points abaft the beam, shipping little ugly water." I cannot understand why this position should be more natural to a screw steamer than any

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other vessel; it has not been so in my experience. I think any vessel left to herself with no motive power will come up to bring the wind about two points before the beam, and fall off to bring it from two to four points abaft, or say average range four points, this means nearly in the trough. Now about the sea, for herein lies the greatest danger. Our present case comes under No. 3 of these remarks, "necessity for heaving-to when running," and resolves itself in this question: is a ship in greater safety when left to *drift only*, to clear a high, fast running sea, than when she is pressed forward by sail or steam at a good rate of speed? An answer to this question settles the quarter system to each individual mind, for or against. From experience, I emphatically say no! even allowing as the writer puts it "ships' sterns are *less* vulnerable than formerly," meaning, I presume, the present elliptical stern in contradistinction to the old square; for I maintain the power and action of the waves remain the same, always allowing for difference of resistance, on both shapes; and to ride, which heaving-to literally means, the best method and safest in my humble opinion is bow on. What ship will stand the amount of water over the stern as is shipped over the bow? A head sea might strike heavily, the pitch over it be great, but the vessel rises and recovers herself; whereas let an advancing sea overtake a ship's stern before she rises to clear it, this means damage to the extent of overwhelming. But who ever heard of a ship being anchored by the stern for safety? or the sea drogue which has been of late so much spoken of, at least in print, who, I ask, would think of putting it over the quarter? Lastly, although I have made some statements on the handling a ship in opposition to the writer of the May letter alluded to, still I admit and like his frankness in stating his views on the behaviour of different ships, and the same ship at different times. To lay down any hard-and-fast rule, for every case, would be egregious folly, all must be governed more or less by circumstances. Still I say, bow-to if possible.

Another letter in the June number, p. 459, wherein the quarter system was adopted, although not stated, for after "the staysail was set, *the helm* put amidships, a considerable amount of drift

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took place leaving a well defined wake to windward." This apparently smoothed the way; the direction of wind and sea acting on the ship is not given, nor the range of her head coming up and falling off. The helm being amidships of course was inactive, consequently she was left to the mercy of the action of the staysail, wind and waves on her.

Drift alone here seems to have been sufficient to smooth the way and clear all danger; for the seas all fell short of the ship, and the ship having come out uninjured is sufficient testimony of its efficacy. Then why trouble to risk a manœuvre in a heavy sea, when by stripping the ship of motive power and leaving her to the care of the wind and waves, she will be safe as it is in human power to make her? It is also said in this letter "many captains of screw steamers complain of small power under these circumstances." But I ask why? if as stated there is none required.

To lie-to certainly requires no great driving power of this kind according to the principle I have been writing on.

If not trespassing on your space, I will make a few more remarks in conclusion, on a letter in your July number, p. 518, wherein it is emphatically stated, "a ship hove-to could not have been struck by a sea four points on the bow, unless she had been driven *nearly* full speed, and under command of her helm." Permit me to put a question to all men of experience on this point—always keeping in view the ship is hove-to—riding. Ex.—A very heavy sea takes the ship on the bow—in the old style; call it lying within five to seven points of the wind. She falls off with its force, but as it sweeps past her it carries the quarter off and brings the bow up to within four points of the wind; and being now well up to the sea, the advancing wave might strike her with great force before her bow has had time to fall off. I have often witnessed this and therefore do not hesitate to say the writer of the letter, June, p. 460 (who suffered and is criticised), is within the bounds of possibility. The same holds good for a sea striking a ship's quarter if exposed, by running the quarter off and bringing the bow round to the sea and wind, or what is meant by broaching to?

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I again repeat I do not believe in this natural position here quoted which a screw steamer takes up whem stopped, my opinion I have already stated, as well as on the subject of a ship not drifting fast enough to clear a side sea.

But in these respects it appears a screw steamer behaves differently from other ships, as well as in some other, for it is stated, "They roll much more heavily when steaming head to sea, than when stopped and have the sea two or three points abaft the beam." And in these two or three points in this direction must lie the whole secret of the quarter system. But neither in the March letter nor in the one just quoted from, is it stated that the writer ever had a ship hove-to according to any of the laws relating thereto. It has been drive, or stop and allow the elements to do the rest, no medium; neither sail nor helm has ever been mentioned; and if these views of putting a vessel in the safest possible position be correct, then has all that has been taught and written on the subject in the past, been but labour and sorrow indeed, and is supplanted by the most simple of all rules, viz., "trust to Nature when in difficulties." I repeat we have not yet arrived at that stage of perfection in build or model and motive power to enable us to set the elements entirely at defiance, nor does it matter for our present argument whether the steamers be one thousand tons or six. The number ten or a hundred that are capable of steaming against the hard gales and heavy seas, do not require heaving-to; it is for those who cannot, that a remedy for safety is required; but I, out of deference to those gentlemen who advocate the *new simple system from experience*, sum up by saying, "Leave it to *that jury* who from constant experience and trial will be best able to decide the question, bow or quarter."

On many nautical points I am conservative and my sentiments on this subject will be understood from what I have written, not from obstinacy or old ideas, but from forty-five years' hard experience of nearly all the difficulties that can befall a sailor whilst at sea.

B. W., Master 33 years.

[Under the signature "B. O. T." the writer of the above letter sent us a communication which we published in our July number.

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page 520. Our correspondent is not anxious for literary fame and prefers to append his initials rather than his full signature. He is however perfectly willing that we should reveal his name to any person taking part in the discussion, if desired.—ED. *N. M.*]

APPROXIMATE FREEBOARD.

To the Editor of the "Nautical Magazine."

DEAR SIR,—I have much pleasure in bringing to your notice the following scheme for freeboard which for several years I have found to answer admirably in actual practice.

It has the merit of leaving the dimension, and the tonnage of the deck erections to determine of themselves a proper freeboard, the alteration of even a decimal in the dimensions producing its proper value in the computation. As yet it has not been made public but I shall be glad to see it in your pages.

Yours very truly,

JAMES WIMSHURST.

Board of Trade, S.W., August 13, 1882.

APPROXIMATE FREEBOARD. FOR FIRST CLASS VESSELS, OF GOOD MODEL, WINTER VOYAGES, SALT WATER.

Flush Main-Decked Vessels.—Rule 1. Multiply the length of vessel by the depth of hold, and divide the product by 100, which gives the freeboard in inches. For vessels having unusual rake of stem, or having the depth measured from top of a double-bottom, adjustment of these dimensions must be made. Lengths under 120, or over 350 feet should not be counted.

Erections on Deck.—Rule 2. When there are substantial erections on deck, the freeboard, as found by Rule 1, may be reduced in the proportion that the gross tonnage of the erections on deck bears to the gross tonnage of ship under deck; thus, if the gross tonnage of the erections is 15 per cent. of the gross tonnage under deck, the freeboard found by Rule 1 may be reduced 15 per cent.

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Spar and Awning-Decked Ships.—These recede from main-decked ships mostly by small degrees, their freeboard can only be determined from a complete knowledge of the details of their construction, &c. The depth is to be measured from the uppermost continuous deck, and the freeboard found by Rule 1, is to be increased in the degree in which the scantlings in the ship, are less than the scantlings required in full main-decked ships.

Measurement of Freeboard.—Freeboard must always be measured at mid-length of ship, and from the top of deck next waterway.

JAMES WIMSHURST.

4, The Grove, Clapham.

[These very simple rules are found to give results nearly approaching those which may be obtained from much more complex rules, and we therefore have pleasure in publishing them. In our August number we printed Sir Digby Murray's rules which the Board of Trade have circulated for the guidance of their officers.—ED. *N.M.*]

HALF A CENTURY OF MERCHANT SHIPPING.

To the Editor of the "Nautical Magazine."

SIR,—For the information of your readers I give you below in tabulated form, from Parliamentary Returns, the tonnage of the merchant navies of the principal maritime countries of Europe and of the United States in each decade from 1830 to 1880, viz.:—

Countries.	1830. Tons.	1840. Tons.	1850. Tons.
British Empire ...	2,531,819	3,811,538	4,232,962
Norway	169,197	276,697	298,315
Hamburg... ...	—	—	71,257
Bremen	20,206	43,647	67,770
Holland	—	—	292,576
Belgium	—	22,610	34,919
France	—	662,500	688,153
United States:—			
Over Sea Trade	576,475	899,765	1,535,711
Home Trade and River Steamers	591,447	1,240,860	1,899,555

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Countries.	1860. Tons.	1870. Tons.	1880. Tons.
British Empire ...	5,710,968	7,149,134	8,447,171
Norway	558,927	1,022,515	1,510,669
Sweden	—	346,862	542,642
Denmark	—	178,646	251,958
Hamburgh ...	142,416	184,496	244,279
Bremen	121,863	171,654	270,209
German Empire ...	—	982,355	1,182,097
Holland	433,922	389,614	328,281
Belgium	33,111	30,149	75,666
France	966,124	1,072,048	919,298
Italy	—	1,012,164	999,196
Austro-Hungary ...	—	329,377	282,571
Greece	263,075	404,063	—
United States:—			
Over Sea Trade	2,546,237	1,516,800	1,352,810
Home Trade ...	2,752,938	2,677,940	2,715,224

In the year 1820, when "George the Third was King," the British Empire possessed 2,648,593 tons of shipping, being 116,774 tons *more* than we possessed in *1830*. Last year (1881) we registered for the British Empire 8,575,560 tons, being an *increase* of 6,043,741 tons during the last half century. So much for the progress of British merchant shipping in this Victorian age!

I am, &c.,

Dock and Port Charges Office, ROBERT THUBRON.
Newcastle-on-Tyne, August 18, 1882.

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BOOKS RECEIVED.

United States Coast and Geodetic Survey. Report for 1878. Washington, U.S.

Of the remarkable volumes connected with the survey of the United States—inland and coastwise—and for which Congress ungrudgingly votes the funds year by year, we have before us the Report for 1878, the latest issued. After entering largely, as a matter of course, into details of field and office work, and of progress made during 1877-1878, the Report for the fiscal year ending with June, 1878, gives a valuable set of Appendices on such widely different subjects as :—Observations of the transit of Mercury in May, 1878,—Adjustment of the primary triangulation between the Kent Island and Atlanta base-lines,—On a physical survey of the Delaware River in front of Philadelphia,—Meteorological Researches for the use of the Coast Pilot, Part II.,—and Discussion of Tides in Penobscot Bay, Maine. The paper on meteorology is the second part of Mr. William Ferrell's researches "on cyclones, tornadoes and waterspouts," in which he discusses at some length the amount of incurvature of the winds in each quadrant of a cyclone in its passage over the ocean, and across the land ; and any new work on the law of storms would be incomplete unless it took notice of these investigations.

Report on the Lighthouses off the Coast of British Burma, for the year 1881-82. Rangoon.

This is the fifteenth annual report on the lighthouses of British Burma. We have reason to believe that the lights are exhibited with regularity, and that both lighthouses and light-vessels are maintained in good order. It will be satisfactory to many of our readers to know that a new lighthouse is in course of construction for the Krishna shoal, that a survey has been made of "The Terribles," on the coast of Kyoukpyoo, with a view to determine the best situation for a lighthouse, and that a small light for the

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Tavoy river having been received from England, it is intended to put up a suitable structure for it as soon as the monsoon permits.

Our Library Table.

Besides the usual *Notices to Mariners* and *Hydrographic Notices*, British and Foreign, we have on our table the following papers, pamphlets, and books:—*The Shipwrecked Mariner* (Morrish, Paternoster Square), the quarterly maritime magazine of the "Shipwrecked Mariners' Society," which contains some short interesting papers on various subjects, and a continuation of the record of "Great Gales." *Our Sailors*, being the Report for 1881 of the progress of the St. Andrew's Waterside Church Mission for sailors, fishermen and emigrants. The *New York Maritime Register*, one number of which gives a good abstract of Mr. Price Edwards's lecture on "Sound Signalling." *Van Nostrand's Engineering Magazine* (New York) for August, *Annalen der Hydrographie und Maritimen Meteorologie*, Heft VII., with the usual quota of nautical and meteorological papers. *Hansa*, for August 13th, gives a good map of the seat of war in Africa, including Tunis and Egypt. *Revue Maritime et Coloniale* (Paris), for July, has a "note on the practical rectification of the point observed,' by M. B. Blanchin, professor of hydrography. The latest numbers of *Le Yacht*, *Das Schiff*, *Forest and Stream*, together with sundry other British, Continental and United States papers, are to hand.

MARINE INVENTIONS.

Patents Published—Compiled for this Journal by Messrs. W. P. Thompson and Boult, British and International Patent and Trademark Agents and Consulting Engineers, 323, High Holborn, London, W.C.; and Berridge Street, Leicester; also by Messrs. W. P. Thompson & Co., 6, Lord Street, Liverpool.

5379. December 9, 1881. Price 6d. James Campbell Baker, of Liverpool, in the county of Lancaster. "Improvements in ventilating ships, buildings, and other structures, mines, tunnels,

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and the like, and in apparatus therefor." This invention is designed to effect ventilation by means of one pipe having numerous orifices. An ordinary pipe with numerous orifices would only draw from one point, namely, the orifice nearest the exhauster, but this is, according to this invention, prevented by proportioning the area of the orifices in a pipe in accordance with the diameter of the pipe. In ventilating ships a main pipe is carried along one or both sides of the centre below the deck, and short pipes branch therefrom at intervals. In tunnels or mines a similar arrangement is made.

5511. December 16, 1881. Price 6d. David Brown Hutton, of Poplar, in the county of Middlesex. "Improvements in instruments for ascertaining the pitch of screw-propellers." This invention relates to an instrument for taking the pitch of propeller blades by forming a right-angled triangle on any part of the diameter by means of said instrument. The instrument consists of two legs jointed together on one leg. There is a plummet, or, preferably, a spirit level. In use the instrument is placed against the propeller boss, and the level adjusted ; it is then adjusted to a predetermined diameter marked on the blade, and by then readjusting the level the pitch is found.

5705. December 29, 1881. Price 6d. William Cooke and Daniel Mylchreest, of Liverpool, in the County of Lancaster, Marine Engineers and Naval Architects. "Improvements in ships' stern posts and rudders." This invention has for its object to provide stern posts and rudders of such construction that the rudder may readily be shipped and unshipped without passing through the counter, whilst being cheaper and more durable than heretofore. The stern post is made with cheeks or bosses, having slots or openings in which the rudder fits and in which it is securely held without its motion being impeded. The said openings are cylindrical near to the stern post (say ¼ of a circle), whilst aft that they open to an angle of say 90°. The stern post is preferably made with a groove extending from one boss to the other, the groove being concentric with the openings in the bosses. The rudder is made in one piece preferably, as described in the specification of Letters Patent, 4803 of 1881, the front end being made to fit the bosses and

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groove on the stern post. The bosses also act as stop-cleats to check the motion of the rudder.

5708. December 29, 1881. Price 6d. John Nock, of Hasskein, on the Golden Horn, in the Empire of Turkey, Engineer. "Improvements in the manufacture of anchors and in apparatus for that purpose." The object of this invention is chiefly the manufacture of anchors from a single bloom of iron or steel without welding, all the parts of the anchor being rolled from one piece. In carrying this invention into practice a square bloom is prepared and rolled out so as to form the shank, a more than sufficient piece of metal being left on the end to form the arms and flukes from. This mass is flattened and split up to, or nearly to, the end of the shank, and the split end spread out on each side for the arms. Each limb is then separately rolled to shape, the shank first and the arms next, the flukes being afterwards finished on swage blocks. For the rolling operation the inventor has designed a special mill, the chief characteristics whereof are, that it has two sets of rollers, each being separately adjustable. The top and bottom roller work, of course, together, and the top roller has its bearings in moveable blocks which can simultaneously be raised or lowered. The two side rollers are vertical, and both their top and bottom bearings adjustable simultaneously by an excentric-link arrangement. Change gear is provided for enabling each part to be made either tapering or straight as desired. By attaching a guide chain the same mill will be made to bend the arms to the requisite curve. This mill is applicable for rolling other heavy pieces of metal also.

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TIDE TABLES FOR SEPTEMBER, 1882.

Also Ports of Reference for the Constants in the next Table.

Week Day.	Month Day.	LONDON BRIDGE.		HULL.		NORTH SHIELDS.		LEITH.		DEVONPORT.		DOVER.		WESTON-SUPER-MARE.		LIVERPOOL.		GREENOCK.		QUEENSTOWN.		KINGSTOWN.		LONDONDERRY.		BREST.	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
		H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
F	1	8 57	4 19	8 31	8 53	5 24	5 47	4 19	4 41	7 48	8 8	1 4	1 27	8 56	9 16	1 4	1 25	1 53	2 14	7 7	7 28	0 53	1 16	9 57	10 18	5 47	6 9
S	2	4 41	5 3	9 15	9 38	6 10	6 33	5 4	5 28	8 29	8 50	1 50	2 13	9 36	9 55	1 46	2 8	2 36	2 58	7 49	8 10	1 39	2 2	10 41	11 6	6 31	6 53
S	3	5 24	5 46	10 1	10 24	6 57	7 22	5 52	6 17	9 11	9 32	2 36	2 59	10 13	10 32	2 30	2 52	3 20	3 42	8 31	8 54	2 23	2 50	11 31	—	7 17	7 43
M	4	6 10	6 35	10 51	11 23	7 50	8 20	6 44	7 15	9 55	10 18	3 22	3 47	10 54	11 21	3 16	3 43	4 5	4 31	9 18	9 45	3 16	3 45	0 6	0 44	8 10	8 39
Tu	5	7 2	7 32	11 58	—	8 55	9 31	7 49	8 27	10 44	11 14	4 14	4 44	11 53	—	4 15	4 51	5 0	5 33	10 17	10 58	4 18	4 56	1 26	2 11	9 13	9 53
W	6	8 7	8 45	0 36	1 15	10 16	10 58	9 10	9 53	11 51	—	5 18	5 56	0 31	1 13	5 33	6 20	6 11	6 55	11 38	—	5 35	6 14	2 53	3 33	10 37	11 21
Th	7	9 31	10 17	1 51	2 33	11 39	—	10 32	11 9	0 33	1 15	6 36	7 16	1 56	2 38	7 5	7 45	7 35	8 16	0 20	1 2	6 53	7 31	4 10	4 42	—	0 8
F	8	10 57	11 32	3 11	3 45	0 17	0 50	11 44	—	1 56	2 34	7 55	8 28	3 18	3 55	8 21	8 51	8 52	9 24	1 42	2 17	8 6	8 38	5 10	5 35	0 40	1 12
S	9	—	0 4	4 16	4 42	1 19	1 42	0 12	0 36	3 8	3 38	8 55	9 18	4 27	4 54	9 15	9 36	9 52	10 16	2 45	3 9	9 6	9 29	5 53	6 16	1 33	2 1
S	10	0 31	0 53	5 3	5 22	2 2	2 21	0 56	1 15	4 3	4 25	9 40	10 0	5 19	5 41	9 55	10 13	10 36	10 56	3 31	3 51	9 50	10 8	6 33	6 55	2 21	2 39
M	11	1 13	1 33	5 40	5 58	2 39	2 55	1 34	1 52	4 46	5 6	10 19	10 36	6 1	6 20	10 33	10 47	11 15	11 33	4 10	4 27	10 24	10 37	7 13	7 30	2 56	3 12
Tu	12	1 50	2 5	6 15	6 31	3 11	3 26	2 8	2 24	5 23	5 39	10 54	11 10	6 37	6 53	11 3	11 19	11 50	—	4 43	4 59	10 54	11 8	7 46	8 0	3 28	3 44
W	13	2 21	2 35	6 47	7 2	3 40	3 54	2 51	3 5	5 55	6 11	11 27	11 44	7 9	7 24	11 34	11 49	0 7	0 23	5 14	5 30	11 22	11 36	8 14	8 28	3 59	4 14
Th	14	2 49	3 5	7 17	7 32	4 9	4 24	3 5	3 20	6 27	6 42	—	0 1	7 39	7 54	—	0 4	0 39	0 54	5 46	6 2	11 52	—	8 42	8 56	4 29	4 44
F	15	3 20	3 34	7 47	8 2	4 40	4 56	3 35	3 50	6 55	7 8	0 17	0 33	8 9	8 23	0 19	0 34	1 9	1 24	6 17	6 32	0 8	0 24	9 10	9 24	4 59	5 14
S	16	3 50	4 4	8 17	8 33	5 12	5 28	4 6	4 22	7 22	7 36	0 50	1 7	8 37	8 51	0 49	1 4	1 39	1 54	6 47	7 2	0 40	0 56	9 38	9 52	5 28	5 43
S	17	4 21	4 35	8 49	9 6	5 44	6 0	4 38	4 55	7 51	8 7	1 21	1 41	9 6	9 22	1 20	1 36	2 10	2 26	7 19	7 36	1 12	1 29	10 8	10 26	5 59	6 17
M	18	4 53	5 7	9 23	9 41	6 18	6 37	5 18	5 33	8 23	8 40	1 58	2 17	9 38	9 54	1 53	2 11	2 44	3 0	7 53	8 10	1 47	2 7	10 45	11 10	6 36	6 55
Tu	19	5 24	5 46	10 1	10 24	6 58	7 22	5 55	6 18	8 58	9 19	2 37	2 57	10 10	10 29	2 30	2 51	3 19	3 39	8 29	8 51	2 28	2 50	11 38	—	7 17	7 41
W	20	6 8	6 32	10 51	11 24	7 49	8 21	6 44	7 16	9 42	10 9	3 20	3 47	10 53	11 23	3 15	3 43	4 3	4 31	9 17	9 47	3 16	3 46	0 11	0 49	8 9	8 42
Th	21	7 1	7 36	—	0 3	8 59	9 41	7 58	8 35	10 41	11 20	4 17	4 59	—	noon	4 17	4 59	5 2	5 43	10 24	11 5	4 21	5 1	1 32	2 20	9 20	10 2
F	22	8 12	8 52	0 43	1 28	10 25	11 7	9 19	10 1	—	0 4	5 26	6 4	0 39	1 22	5 44	6 31	6 20	7 3	11 48	—	5 41	6 21	3 2	3 41	10 47	11 31
S	23	9 44	10 25	2 2	2 41	11 47	—	10 41	11 16	0 50	1 36	6 45	7 25	2 6	2 47	7 14	7 52	7 45	8 25	0 31	1 11	7 1	7 37	4 16	4 45	—	0 11
S	24	11 2	11 36	3 17	3 51	0 24	0 53	11 48	—	2 17	2 54	8 2	8 38	3 27	4 3	8 25	8 55	8 59	9 34	1 49	2 21	8 11	8 42	5 11	5 35	0 46	1 17
M	25	—	0 8	4 20	4 46	1 20	1 45	0 15	0 39	3 28	3 54	9 0	9 25	4 36	5 5	9 23	9 43	9 58	10 23	2 50	3 16	9 10	9 35	5 53	6 22	1 43	2 7
Tu	26	0 33	0 57	5 8	5 30	2 7	2 28	1 2	1 24	4 21	4 46	9 50	10 15	5 31	5 59	10 4	10 23	10 48	11 12	3 10	3 34	9 56	10 17	6 45	7 8	2 20	2 51
W	27	1 21	1 43	5 52	6 15	2 49	3 10	1 46	2 8	5 10	5 34	10 40	11 4	6 21	6 45	10 48	11 11	11 36	11 59	4 28	4 52	10 39	11 0	7 31	7 53	3 13	3 35
Th	28	2 4	2 20	6 38	7 1	3 32	3 54	2 30	2 51	5 58	6 21	11 28	11 53	7 8	7 31	11 34	11 57	—	0 22	5 15	5 38	11 22	11 44	8 14	8 36	3 57	4 19
F	29	2 50	3 12	7 24	7 47	4 16	4 39	3 15	3 36	6 44	7 6	0 13	0 36	7 54	8 14	—	0 10	0 45	1 8	6 1	6 23	—	0 7	8 54	9 15	4 41	5 3
S	30	3 38	3 54	8 9	8 31	5 2	5 25	3 56	4 19	7 29	7 49	0 49	1 9	8 36	8 55	0 41	1 0	1 34	1 57	6 46	7 7	0 30	0 53	9 36	9 57	5 23	5 47

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TIDAL CONSTANTS

For Various British, Irish, and European Ports.

By applying the Tidal Constant of the place, according to its sign (+ *add* − *sub*), to the time of high water on the given day at the port of reference, you have the time of high water at the place sought.

Place.	Constant.	Port of Reference.
	H. M.	
Aberdeen	−1 17	Leith
Aberystwyth	−3 52	Liverpool
Alderney	+2 59	Brest
Antwerp	+5 13	Dover
Arbroath	−0 42	Leith
Arcachon	+0 50	Brest
Arklow	−2 25	Kingstown
Ayr	−0 18	Greenock
Banff	−1 49	Leith
Bantry harbour	−1 14	Queenstown
Barnstaple bridge	−0 26	Weston-s.-Mare
Bayonne	−0 2	Brest
Beachy head & Rye bay	+0 8	Dover
Beaumaris	−0 51	Liverpool
Belfast	+2 42	Londonderry
Berwick	−1 5	N. Shields
Blyth	−0 8	N. Shields
Bordeaux	+3 3	Brest
Boulogne	+0 13	Dover
Bridport	+0 24	Devonport
Bristol & King Road	+0 19	Weston-s.-Mare
Cadiz	−2 2	Brest
Caernarvon	−1 56	Liverpool
Calais	+0 37	Dover
Campbellton	−0 23	Greenock
Cardiff	+0 2	Weston-s.-Mare
Cardigan bar	−4 22	Liverpool
Carlingford bar	−0 10	Kingstown
Chatham	−0 47	London
Cherbourg	+4 2	Brest
Coleraine	−1 37	Londonderry
Coquet Road	−0 23	N. Shields
Cordouan Tower	−0 10	Brest
Cowes (West)	−0 27	Dover
Crinan	+4 41	Greenock
Cromarty	−2 21	Leith
Dartmouth	+0 33	Devonport
Deal & Downs	+0 3	Dover
Dieppe	+7 19	Brest
Donaghadee	+0 3	Kingstown
Donegal harbour	+0 17	Queenstown
Douglas & Ramsay	−0 11	Liverpool
Dublin bar	+0 2	Kingstown
Dundalk	−0 16	Kingstown
Dungeness	−0 27	Dover
Dunkerque	+0 56	Dover
Exmouth	+0 38	Devonport
Falmouth	−0 46	Devonport
Fecamp	+6 57	Brest
Ferrol	−0 47	Brest
Flamborough head	−1 59	Hull
Fleetwood	−0 12	Liverpool
Folkestone	−0 5	Dover
Fowey	−0 29	Devonport
Flushing	+1 42	Dover
Galway bay	−0 26	Queenstown
Gibraltar	−1 27	Brest
Glasgow (Port)	+0 10	Greenock
Gloucester	+2 51	Weston-s.-Mare
Granville	+0 26	Brest
Gravesend	−0 48	London
Grimsby (Great)	−0 53	Hull
Guernsey (St. Peter)	+2 50	Brest
Hartlepool	+0 5	N. Shields
Harwich	−1 52	London
Havre	+6 4	Brest
Helgoland	+0 21	Dover
Holyhead	−1 12	Liverpool
Holy Island harbour	−0 53	N. Shields
Honfleur	+5 42	Brest
Inverness	−1 59	Leith
Jersey (St. Helier)	+2 38	Brest
Kinsale	−0 18	Queenstown
Lerwick (Shetland)	−3 47	Leith
Limerick	+1 15	Queenstown
Lisbon Bar	−1 17	Brest
Littlehampton	+0 24	Dover
Llanelly bar	−0 38	Weston-s.-Mare
Lowestoft	−4 1	London
Lynn & Boston Deep	−0 29	Hull
Margate	−2 18	London
Maryport	+0 3	Liverpool
Milford Haven entr.	−0 58	Weston-s.-Mare
Montrose	−0 52	Leith
Morlaix	+1 6	Brest
Needles point	−1 26	Dover
Newcastle	+0 23	N. Shields
Newhaven	+0 39	Dover
Newport	+0 16	Weston-s.-Mare
Nieuport	+1 6	Dover
Nore	−1 28	London
Orfordness	−2 43	London
Oporto	−1 17	Brest
Ostende	+1 13	Dover
Padstow	−1 41	Weston-s.-Mare
Peel, Isle of Man	−0 15	Liverpool
Pembroke Dock	−0 42	Weston-s.-Mare
Penzance	−1 13	Devonport
Peterhead	−1 43	Leith
Piel harbour, Barrow	−0 18	Liverpool
Plymouth breakwater	−0 6	Devonport
Poole	−2 2	Dover
Port Carlisle	+0 47	Liverpool
Portland breakwater	+1 18	Devonport
Port Patrick	−0 58	Greenock
Portsmouth	+0 29	Dover
Ramsgate	−2 19	London
Rotterdam	+4 33	Dover
Santander	−0 17	Brest
Scarborough	+0 48	N. Shields
Selsea bill	+0 23	Dover
Sheerness	−1 21	London
Shoreham	+0 22	Dover
Sligo bay	+0 17	Queenstown
Southampton	−0 42	Dover
Spurn point	−1 8	Hull
St. Ives	−2 10	Weston-s.-Mare
St. Malo	+2 18	Brest
St. Mary (Scilly)	−1 16	Devonport
St. Nazaire	−0 7	Brest
Stornoway	+6 38	Greenock
Stromness (Orkneys)	−5 17	Leith
Sunderland	−0 1	N. Shields
Swansea bay	−0 53	Weston-s.-Mare
Tay bar	−0 11	Leith
Tees bar	+0 22	N. Shields
Tenby	−1 12	Weston-s.-Mare
Thurso	−5 49	Leith
Torbay	+0 17	Devonport
Tralee bay	−0 58	Queenstown
Ushant (Ouessant)	−0 15	Brest
Valentia harbour	−1 19	Queenstown
Waterford	+0 19	Queenstown
Westport	−0 4	Queenstown
Wexford	+2 20	Queenstown
Whitby	+0 22	N. Shields
Whitehaven	−0 9	Liverpool
Wick	−2 55	Leith
Wicklow	−0 41	Kingstown
Workington	−0 19	Liverpool
Yarmouth road	−4 43	London
Youghall	+0 13	Queenstown

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MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
291	England — Thames River Entrance — Duke of Edinburgh (Bullock) Channel	Buoyage.
292	English Channel—Owers Light-vessel	To be altered in position.
293	England—West Coast—Hartland Point	Alteration of fog-signal.
294	France—North Coast — St. Valery en Caux	Alteration in tidal light.
295	„ „ Paon Point, Ile Brehat	Alteration in light.
296	North Sea—Weser River Entrance	Alteration in fog-signals.
297	Norway — West Coast — Kors Fiord — Marstens-Bo Rock	Depth of water on rock.
298	Baltic Entrance — Sound — Lappe Ground	Intended light, pilot vessel and fog-signal.
299	Baltic — Gulf of Bothnia — Sweden—Shoal	Position of shoal recently placed on Swedish chart.
300	Spain—South Coast — Cadiz Bay — Las Puercas Rocks	Character of light and buoyage of the bay.
301	Mediterranean—France—Cette	New light and alteration in breakwater light.
302	„ Algeria—Port Cala	Intended alteration in colour of light.
303	„ Italy — West Coast — Santa Euphemia Gulf — Santa Venere	West entrance of port closed.
304	„ Ionian Islands—Santa Maura—Port Drepano	Sunken rock at entrance.
305	„ Egypt—Alexandria	Lights again in working order.
306	Africa—West Coast—Cape Verde Islands —Porto Grande, St. Vincent Island	New light.
307	„ „ Bight of Benin—Lagos	Light altered in colour.
308	South Atlantic—Strait of Le Maire	Directions.
309	Malacca Strait — Pulo Lumaut and Jugra River	Particulars of lights.
310	Eastern Archipelago — Sourabaya Strait—Madura Island	Particulars of leading lights.
311	China Sea—Palawan—East Coast—Port Royalist	New light.
312	Japan—Yezo Island—Cape Noyshap and Nemoro	Alteration in period of exhibition of lights.
313	South Australia—Cape Banks	Particulars of intended light.
314	„ Spencer Gulf—Corney Point	Arc of reflected light.
315	„ „ Port Paterson	New buoy on entrance spit.
316	Australia—Victoria—Port Phillip Bay —Point Nepean	Jetty light, quarantine station.
317	South America—West Coast—Chilé—Port Corral	New light.
318	United States—Rhode Island—Narragansett Bay—Whale Rock	New light and fog-bell.
319	„ „ Warwick Neck	New fog-signal at lighthouse.
320	„ New Hampshire — Portsmouth Harbour—Kitt Rocks	Automatic whistle buoy.
321	„ Massachusetts — Pollock River	Light-vessel altered in position.
322	Canada—Nova Scotia—Cranberry Island	Fog-signal re-established.
323	Newfoundland—South Coast—St. Pierre Island—Cape Noir	Discovery of shoal.
324	„ „ Great Miquelon Island—Seal Rocks	Automatic whistle buoy.

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NAUTICAL NOTICES.

All Bearings Magnetic, unless otherwise stated.

291.—ENGLAND.—*Thames River Entrance.—The Duke of Edinburgh (Bullock) Channel.— Buoyage.*— With reference to Notice No. 212, p. 548, on intended buoyage and beacon to mark the Duke of Edinburgh Channel, hitherto known as Bullock Channel, the following buoys and beacon have been placed to mark the above-named channel, the least breadth of which is 8 cables between the buoys, and which has a depth of from 6 to 10 fathoms, with the exception of a small patch of 30 feet lying nearly 4 cables N.N.E. ½ E. from N.E. Middle Shingles buoy, and 6½ cables W. ¼ N. from S.W. Long sand buoy.

On the North Side of the Channel.—(1.) *South Long Sand Buoy*, 13 feet conical, black, surmounted with staff and two globes placed vertically, lies in 11 fathoms, with—Margate New church tower, its width opened westward of the Deaf and Dumb Asylum tower, S. by W.; Tongue light-vessel, S.W. ¼ S., distant 3 miles; East Shingles buoy, W. by S. ¼ S., distant 1_{10}^{7}ths mile.

(2.) *South-West Long Sand Buoy*, 8 feet conical, black, lies in 6¼ fathoms, with—Minster mill, just open eastward of a large block of houses in Westgate bay, S. by W., W¼·; Shingles beacon, twice its height westward of Herne high mill, S.W. ½ W.; South Long sand buoy, S.E. by E. ¼ E., distant 1_{10}^{6}ths mile; Tongue knoll buoy, S.S.E., distant 3_{10}^{6}ths mile.

(3.) *West Middle Long Sand Buoy*, 8 feet conical, black, lies in 6¼ fathoms, with—Shingles beacon in line with the west end of St. Nicholas wood, S.S.W. ¼ W.; S.W. Long sand buoy, S.E. ¼ S., distant 1_{10}^{3}ths mile.

(4.) *West Long Sand Buoy*, 13 feet conical, black, lies in 6¼ fathoms, with—The new beacon (N.E. Shingles) three times its height westward of Shingles beacon and midway between it and Mount Pleasant house, S. ½ W., distant 1_{10}^{3}ths mile; West Middle Long sand buoy, S.E. ¼ E., distant 1_{10}^{3}ths mile.

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On the South Side of the Channel.—(1.) *North-west Shingles Buoy*—Colour and character altered to red and white horizontal bands, surmounted with staff and triangle.

(2.) *East Shingles Buoy*, 18 feet conical, black and white horizontal bands, surmounted with staff and diamond, lies in 5 fathoms, with—Shingles and Pan sand beacons in line, W. ¼ S.; Minster mill in line with the first house on Ledge Point, S. by W. ¼ W.; Tongue light-vessel, S. by W. ¼ W., distant $1\frac{n}{10}$ths mile.

(3.) *North-East Middle Shingles Buoy*, 8 feet cylinder, black and white vertical stripes, lies in 8¼ fathoms, with—Chislet mill, just open eastward of Reculvers Coastguard station, S.W. ¼ S.; S.W. Long sand buoy, E. by N. ¼ N., distant 9 cables; East Shingles buoy, S.E. by S., S^{ly}., distant $1\frac{4}{10}$ths mile.

(4.) *North-East Shingles Beacon*, being the new beacon erected on the northern part of Shingles sand in 4 feet water, is painted black, and surmounted with a St. Andrew's cross, 30 feet above high water, with—Shingles beacon, nearly midway between Minster mill and Powells belfry (rather nearer the latter), S. ¼ W., S^{ly}.; West Long sand buoy, N. ¼ E., distant $1\frac{3}{10}$ths mile; N.E. Shingles buoy, E. ¼ S., distant 5 cables.

(5.) *North-East Shingles Buoy*, 8 feet cylinder, black and white chequered, lies in 7¼ fathoms, with—Monkton and Shingles beacons in line, S. by W. ¼ W.; West Middle Long sand buoy, N.E. by E. ⅜ E., distant 8 cables; N.E. Middle Shingles buoy, S.E. by S., S^{ly}., distant $1\frac{3}{10}$ths mile.

(6.) *North Shingles Buoy*, 8 feet cylinder, black and white vertical stripes, lies in 7¼ fathoms, with—Sarr mill just opened eastward of St. Nicholas wood, S. by W. ¼ W.; West Long sand buoy, N.E. ¼ N., N^{ly}., distant $1\frac{1}{10}$th mile; N.E. Shingles beacon (new), S.E. by E. ¼ E., distant 6 cables.

(7.) *Middle Shingles Buoy*, 8 feet cylinder, black and white chequered, lies in 7¼ fathoms, with—Herne hill mill in line with Pan sand beacon, S.S.W. ¼ W.; North Shingles buoy, E. ¼ N., N^{ly}., distant 2 miles; N.W. Shingles buoy, W. by S. ¼ S., S^{ly}., distant $1\frac{9}{10}$ths mile.

(8.) *Knock John Buoy*, 8 feet conical, black, lies in 6 fathoms, with—Girdler beacon in line with Reculvers, S. by W. ¼ W.;

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North Shingles buoy, E. by S. ½ S., S½E., distant 2$\frac{1}{10}$th miles; Middle Shingles buoy, S. ¼ E., E½S., distant 9 cables.

Note.—All depths given are at low water spring tides. *Variation*, 17¼° *W.*

292.—ENGLISH CHANNEL.—*Owers Light-vessel.—Intended Alteration in Position.*—It is intended shortly to move the Owers lightship from her present position, 6 cables W. ½ S., into 15 fathoms at low water spring tides. Masters of coasting vessels and others when to the eastward of the lightship, and working under the lee of the Owers rocks, are to be careful not to bring the lightship to bear to the southward of S.W. by W., as the line from Eastborough head buoy to the proposed position of lightship does no clear the shoal of the lead. Due notice will be given when the change has been effected.

293.—ENGLAND. — *West Coast.—Hartland Point. — Intended Alteration in Character of Fog-Signal.*—At an early date, probably the beginning of October, the distinctive character of the fog-signal at Hartland point will be altered so as to give *two blasts* in quick succession every *two minutes* in the following manner, viz.:—the first blast a high note, the second a low note. Further notice will be given.

294.—FRANCE.—*North Coast.—Alteration in Tidal Light at St. Valery en Caux.*—The tidal light hitherto exhibited from the top of an iron standard on the west pier of the harbour of St. Valery en Caux, has been transferred to a tower, constructed of masonry, and recently erected near the present position of the light. It is a *fixed white* light, varied by *flashes* every *thirty seconds*: elevated 43 feet above high water; the fixed light should be visible from a distance of 9 miles, and the flashes from a distance of 12 miles. Position as given, lat. 49° 52′ 30″ N., long. 0° 42′ 30″ E.

295.—FRANCE.—*North Coast.—Alteration in Paon Point Light, Ile Brehat.*—This light (*fixed red*) will, in future, be obscured over an arc of 45°, or between the bearings of N. 52° E. and N. 7° E. Sectors of *white* light will be shown between the bearings of N. 52° E. and S. 83° E., and between N. 25° W. and N. 33° W. The light will therefore show *red* between the bearings of N. 7° E.,

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through North to N. 25° W.; *white* from N. 25° W. to N. 33° W.; *red* from N. 33° W., through west and south to S. 83° E.; and white from S. 83° E. to N. 52° E. Position, lat. 48° 52′ 10″ N., long. 2° 59′ 0″ W. *Variation*, 19° *W.*

296.—North Sea.—*Weser River Entrance.—Weser and Bremen Light-Vessels.—Intended Alterations in Fog-Signals.*—It is intended during the current year to make the following alterations in the fog-signals at Weser and Bremen light-vessels, Weser river entrance:—

Weser Light-Vessel, from which during foggy weather a bell now gives *five* loud sounds *every two minutes*, will, in addition, be furnished with a steam fog-horn, which will be blown for *twenty seconds* with intervals of *twenty seconds*.

Bremen Light-Vessel, from which a bell is now sounded during foggy weather, will also be furnished with a gong.

297.—Norway.—*West Coast.—Kors Fiord Entrance.—Depth on Marstens-Bo Rock.*—This rock which lies W. ¼ N., 8 cables from Marsten lighthouse, and on which the Earl of Ducie's yacht *Severn* was wrecked on the morning of the 11th July last, had a depth of about 5 feet at low water on that day. The water over the rock was then as calm as the surrounding sea, and thus gave no indication of danger. This rock, however, is almost always visible by the sea breaking upon it, and the treacherous smoothness experienced on the above occasion does not, it is said, occur for more than a few days in the year. *Variation*, 17¼° *W.*

298.—Baltic Entrance.—*The Sound.—Intended Light and Pilot-Vessel with Fog-Signal Northward of Lappe Ground.*—Early in September, 1882, a light and pilot-vessel will be placed northward of Lappe ground, at the northern entrance to the Sound. The light will be a *white double flashing minute* light, showing two successive flashes of *two and a-half seconds'* duration, divided by an eclipse of about *nine seconds*, the second flash being followed by an eclipse of about *forty-six seconds*. The light (exhibited from the foremast) will be elevated 30 feet above the sea, and should be visible from a distance of about 10 miles. A riding light will also be shown from the forestay, 6 feet above the rail. The vessel, painted red with a white cross bearing the name

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Lappegrunden, and red globe at foremast head, will be moored in 11 fathoms water, about 2¼ cables N. ¼ W. from the red conical buoy with red staff and globe, marking the north extreme of Lappen sand. Position, lat. 56° 4′ 5″ N., long. 12° 36′ 35″ E. A steam siren fog-signal will also be established at Lappe ground light-vessel, which, during thick or foggy weather, will give *two blasts* in quick succession *every minute*.

Note.—Elsinore sea and harbour pilots may be obtained from this light-vessel, which will, when the ice allows, be kept at her station throughout the year—the light will be exhibited in accordance with other Danish lights. *Variation*, 11¼° *W.*

299.—BALTIC.—*Gulf of Bothnia.—Sweden.—Shoal.*—A small shoal, with 12 feet water on it, and marked by a perch with two balls, has recently been placed on the Swedish chart of Gefle bay; it lies about a mile south-eastward of the Storgrund patch (marked by perches at north and south ends), 4 miles from the light on Storjungfrun. Approximate position, lat. 61° 9′ N., long. 17° 29½′ E. (It only appears on the Swedish chart, corrected to 1881.)

300.—SPAIN.—*South Coast.—Cadiz Bay.*—(1.) *Light on Las Puercas Rocks.*—With reference to Notice in 1881, on the exhibition of a temporary light from a beacon situated on the west extreme of Las Puercas rocks, Cadiz bay; it is an *occulting white* light, visible *ten seconds*, and eclipsed *ten seconds*. The lighthouse is painted black and white in horizontal bands.

(2.) *Buoyage.*—With reference to Notice in 1881, on the withdrawal of the bell buoy and erection of a beacon on Los Cochinos rocks, south side of the main channel to Cadiz harbour, the bell buoy has been withdrawn, but the beacon has not been erected.

El Fraile buoy, conical with globe and base coloured black, now lies in 4 fathoms water, with—Las Puercas beacon, W. by N. ¼ N., distant 6¼ cables. Extremity of San Felipe pier (extended about 1¼ cable), S. ½ W., distant 6¾ cables.

El Diamante shoal is now marked on its western edge by a boat buoy, coloured red, lying in 5 fathoms water, with—La Galera buoy (black), N.E., distant 8 cables. Las Puercas beacon, S.S.W. ¼ W., distant 9 cables.

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The conical red buoy marking Cabezo de los Asnos, now lies with—Rota pier head, N.E. ¼ E. Las Puercas beacon, S.S.E. ¼ E.

Cabezuela shoal buoy (red) now lies in 3½ fathoms water, with—Puntales castle, S.S.W., distant 1 $\frac{1}{10}$th miles. Extremity of San Felipe pier, N.W. ¼ W.

Palma shoal buoy (black) now lies in 4¾ fathoms water, with—Puntales castle, S. by W., distant 8 cables. Extremity of San Felipe pier, N.W. by N. *Variation*, 18° *W.*

301.—MEDITERRANEAN.—*France.*—(1.) *Light at Cette.*—Exhibited from a lighthouse constructed of masonry, recently erected on the shore, at about 980 yards eastward of Frontignan jetty, Cette, on the site of the former battery of La Verrerie. It is a *flashing* light, showing a flash every *four seconds*, and elevated 66 feet above high water; it shows *white* except in the direction of the breakwater, where there is a sector of *red* light between the bearings of N. 39° E. and N. 14° E. The *white* light should be visible from a distance of 12 miles, and the *red* light from a distance of 7 miles.

Note.—As the works of prolongation of the breakwater advance, the sector of *red* light will be extended to the eastward, so that the eastern limit will always fall at least one cable eastward of these works. Position as given, lat. 43° 24′ 35″ N., long. 3° 42′ 35″ E.

(2.) *Alteration in Breakwater Light, Cette.*—The breakwater light would also be altered in such a manner that it will show *fixed red* between the bearing of N. 78° E., through north to S. 88° W., and *fixed white* from S. 88° W., through south to N. 78° E. The *red* light will be visible as heretofore, from a distance of 6 miles, and the *white* light from a distance of 11 miles.

Caution.—When the breakwater light shows *red*, vessels should not approach the harbour until the *white* sector of La Verrerie is seen; when the breakwater light appears *white*, vessels may safely approach either the eastern or western channels into the harbour. *Variation*, 15° *W.*

302.—MEDITERRANEAN.—*Algeria.—Port Cala Light.—Intended Alteration in Colour.*—On 15th August, 1882, the following

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alteration was to be made in the colour of the harbour light exhibited on the eastern side of entrance to port Cala (La Calle); the present fixed white light would be replaced by a *fixed red* light, visible from a distance of 9 miles.

303.—MEDITERRANEAN.—*Italy.—West Coast.—Gulf of Santa Euphemia—Santa Venere.—Western Entrance of Port Closed.*—The western entrance of the port of Santa Venere, near Pizzo, has been closed by an arm of the mole, which, commencing from the western extremity of the existing breakwater, and extending in S. by E. direction, will terminate at the shore.

Note.—Vessels entering the port should pass eastward of the end of the existing breakwater, indicated by a floating *fixed red* light. *Variation*, 10° *W.*

304.—MEDITERRANEAN.—*Ionian Islands.—Santa Maura.—Port Drepano.—Sunken Rock on Eastern Side of Entrance.*—Information has been received of the existence of a sunken rock lying about three-quarters of a cable from the shore, eastward of Aspro Yali bay, eastern side of entrance to port Drepano. This rock (*Miasulis rock*), with 6 feet over it, and 6 to 8 fathoms around, lies with the following bearings and distances:—Western entrance point, Vathi Vali bay, East, distant $1\frac{1}{2}$ cable; Point Kephali, N.W. by W. $\frac{1}{4}$ W., distant $3\frac{1}{4}$ cables. *Variation*, 8° *W.*

305.—MEDITERRANEAN. — *Egypt. — Alexandria Light.* — With reference to Notice, No. 271, p. 637, Admiral Sir F. Beauchamp P. Seymour, G.C.B., Commander-in-Chief, Mediterranean Station, under date 27th July, 1882, states that Alexandria light (Eunostos point) is *again in working order.*

306.—AFRICA.—*West Coast.—Cape Verde Islands.—Light at Porto Grande.—St. Vincent Island.*—Exhibited from the summit of Bird island (Jow island), entrance to Porto Grande. It is a *fixed white* light, elevated about 290 feet above the level of the sea, and visible from a distance of about 20 miles. The lighthouse is constructed of iron. Position, lat. 16° 54′ 40″ N., long. 25° 1′ 10″ *W.*

307.—AFRICA.—*West Coast.—Bight of Benin.—Lagos Light, Alteration in Colour.*—After 1st August, 1882, the harbour light exhibited on the eastern entrance point of Lagos river would be a

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fixed white light (instead of red as previously), elevated 60 feet above high water, and visible from a distance of 8 miles; it will be shown from an iron tripod, 65 feet high, and painted white.

308.—South Atlantic.—*Strait of Le Maire.*—Captain J. M. Gray, of the *Shun Lee*, from long experience, recommends that sailing-vessels coming from the northward should not attempt to enter the strait until one hour after high water. He states that it is his practice on arriving near the strait to wait five or six miles to the northward until a little after high water. Also, that in March, 1881, he entered the strait at that time of tide, and although it was blowing a gale from the S.W., the ship drove through rapidly.

309.—Malacca Strait.—(1.) *Pulo Lumaut Light.—Alteration in Position.*—The light previously exhibited from the west point of Pulo Lumaut, is now shown from the S.E. extremity of the islet N.W. of that position. Position approximate, lat. 2° 53′ 40″ N., long. 101° 12′ 0″ E.

(2.) *Harbour Light at Jugru River Entrance.*—A harbour light is now exhibited from a lighthouse erected on the southern entrance point of Jugru (Jugra or Ingra) river entrance; it is a *fixed white* light, visible from a distance of 4 miles. The lighthouse is constructed of wooden framework, with upper part painted white. Position approximate, lat. 2° 48′ 0″ N., long. 101° 21′ 20″ E.

310.—Eastern Archipelago.—*Sourabaya Strait.—Madura Island.—Particulars of leading Lights.*—With reference to Notice No. 278, p. 638. on the exhibition of leading lights on the west coast of Madura island, and the withdrawal of Sourabaya light-vessel, further information has been given that the southern light (at Sembilangan) is elevated 174 feet above high water, and should be visible from a distance of 19 miles, between the bearings of S.E. ¼ E., through south, to S.W. The northern light (at cape Piering) is elevated 46 feet above high water, and should be visible from a distance of 9 miles, between the bearings of N.E. ¼ E., through east and south, to S.W. ¾ W. In place of Sourabaya light-vessel, which has been withdrawn, a white Herbert's beacon buoy has been laid out near the northern entrance of the river Solo. *Variation*, 0¼° *E.*

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311.—China Sea.—*Palawan.—East coast.—Light at Port Royalist.*—Established on Tide pole point (*Saboruco point*), north side of port Royalist (Puerto Princesa or Yuahit). It is a *fixed white* light, elevated 43 feet, and visible from a distance of 6 miles, between the bearings of W. by N., through north and east, to S.E. The light is exhibited from a tower painted white; the dwelling of the light-keeper is joined to the northern side of the tower. Position as given, lat. 9° 43′ 45″ N., long. 118° 42′ 5″ E. *Variation*, 1¼° *E.*

312.—Japan. — *Yezo Island.—Cape Noyshap and Nemoro Lights, Alteration in Period of Exhibition.*—The light exhibited on cape Noyshap (Noshaf or Noyshaf), and the light exhibited on Benten-sima, Nemoro anchorage, previously shown from 1st April to 15th December, will, in future, be exhibited throughout the year except during the month of February when no light will be shown.

313.—South Australia.—*Intended Light on Cape Banks.*—With reference to Notice No. 141, p. 308, on the intended exhibition of a light from a lighthouse to be erected on the point near cape Banks, adjacent to Carpenter rocks, and known as Carpenter rocks point; further notice has been given, that on or about 1st January, 1883, the light will be exhibited. It will a *revolving* light, showing *one red* and *two white* lights at intervals of *twenty seconds* each, the whole revolution occupying *sixty seconds*; elevation 92 feet above the sea; the white light should be visible from a distance of about 10 miles, the red light from about 8 miles. Position, lat. 37° 54′ 15″ S., long. 140° 23′ 10″ E.

314.—South Australia.—*Spencer Gulf.—Corny Point Light.—Arc of Reflected Light.*—With reference to Notice No. 108, p. 233, on the intended exhibition, on 1st March, 1882, of a *fixed white* light on Corny point, east side of Spencer gulf, which would be visible seaward between the bearings of N. 45° E. and S. 65° W., —further notice has been given that an arc of reflected light from Corny point lighthouse is visible inshore of Webb rock, and unless the night be clear and the land in sight, might (in the absence of bearings) be mistaken for the true light. Vessels approaching from the southward, should not bring Corny point lighthouse to bear to the northward of N.E. ½ E., until past Webb rock. The

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reflected light may, in clear weather, be seen from a distance of about 10 miles, inside the bearing of N.E. ¾ N. This inner passage should never be attempted at night by a sailing vessel, unless with a fair wind and thorough knowledge of the coast. *Variation*, 4° *E.*

315.—South Australia.—*Spencer Gulf.—Port Patterson.*—A perch buoy, painted red, has been placed on a spit recently formed at the south entrance to port Paterson, Spencer gulf, lat. 32° 38′ S., long. 137° 46½′ E. The buoy is moored in 14 feet at low water spring tides.

316.—Australia.—*Victoria.—Port Phillip Bay.—Jetty Light, Quarantine Station, Point Nepean.*—A *green* light is now exhibited from the end of the Sanatory station jetty, point Nepean, visible from a distance of 2 or 3 miles.

317.—South America.—*West Coast.—Chilé.—Light at Port Corral.*—Established at port Corral, in the entrance to the port of Valdivia, and 55 yards westward of the harbour master's office; it is a *fixed red* light, elevated 108 feet above the level of the sea. From the position of this light, Niebla castle lighthouse bears N. 22° E., and the north extreme of Manzera island bears N. 72° E. (Bearings as given.) *Variation*, 19° *E.*

318.—United States.—*Rhode Island.—Narragansett Bay.—Light and Fog-Bell on Whale Rock.*—On and after October 1, 1882, a *fixed red* light will be exhibited from the lighthouse recently constructed on Whale rock, western entrance to Narragansett bay. The apparatus lights 315° of the horizon (W.N.W. by eastward to W.S.W.,); elevation 73 feet above mean low water. The light should be seen from a distance of 14 miles. The structure is a cast-iron tower, in the form of a frustum of a cone, standing on a cast-iron pier filled with concrete. The tower is painted white, the pier red, and the lantern black. Approximate position, lat. 41° 26′ 40″ N., long. 71° 25′ 25″ W. A fog-bell, struck by machinery, will be sounded, giving one blow at intervals of 20 seconds during thick and foggy weather.

319.—United States.—*Rhode Island.—Narragansett Bay.—Fog-Signal at Warwick Lighthouse.*—A fog-signal has been established at Warwick lighthouse, southern extremity of Warwick

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neck, Narragansett bay; the signal is a bell struck by machinery, which, during thick or foggy weather, will give *one* blow *every twenty seconds.*

320.—UNITED STATES.—*New Hampshire.—Portsmouth Harbour. —Automatic Whistle Buoy Southward of Kitt Rocks.*—On or about 1st August, 1882, the red can buoy southward of Kitt rocks, eastern side of entrance to Portsmouth harbour, would be replaced by a buoy fitted with an automatic whistle. This buoy, painted red, with the letter P. in white on the side, is surmounted by a whistle giving blasts at short intervals.

321.—UNITED STATES. — *Massachusetts.—Pollock Rip Light-Vessel—Alteration in Position.*—In consequence of recent changes in the shoals in the Monomoy passage, the position of Pollock Rip light-vessel, northern entrance to Nantucket sound, has been moved three-quarters of a mile N.W. by N. from her previous position, and now lies with the following bearings and distances:—Nantucket (Great point) lighthouse, S.W. ¼ S., distant 10¼ miles. Monomoy point lighthouse, N.W. by W. ¼ W., distant 3⅛ miles. Position, lat. 41° 32′ 30″ N., long. 69° 55′ 40″ W. *Variation*, 12° *W.*

322.—CANADA.—*Nova Scotia.—S.E. Coast.—Cape Canso.—Fog-Signal on Cranberry Island.*—With reference to previous Notice on the destruction by fire of the fog-signal, the signal has been re-established; it is a steam whistle, which, in thick, or foggy weather, or during snowstorms, will give blasts of *eight seconds'* duration, separated by intervals of *fifty-two seconds'* duration.

323.—NEWFOUNDLAND.—*South Coast.—St. Pierre Island.—Shoal South of Cape Noir*—A shoal, over which there is a depth of 2 fathoms, has been discovered in the approach to South channel, St. Pierre harbour. From this shoal (*Indre shoal*), which is situated 1¼ cables S.S.E. from cape Noir, cape Rouge is open a little westward of the church on Chien island, and Black rock is nearly in line with the south extreme of Pelée island. *Variation*, 28¼° *W.*

324.—NEWFOUNDLAND.—*South Coast.—Great Miquelon Island.—Automatic Buoy Near Seal Rocks.*—A buoy fitted with an

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automatic whistle has been placed 6¾ cables westward of the S.W. rocks of Seal (Veaux-marins) group, western side of Great Miquelon island; the buoy, painted black and 8 feet in diameter, is moored in 17½ fathoms water. Position approximate, lat. 47° 2′ N., long. 56° 32′ W.

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Colonial Inquiries.

An Act to amend the Merchant Shipping Acts, 1854 to 1880, with respect to Colonial Courts of Inquiry.

45 *and* 46 *Vict.*

Whereas it is expedient to amend the Merchant Shipping Acts, 1854 to 1880, with respect to Inquiries held in British possessions abroad into charges of incompetency or misconduct on the part of masters, mates, or engineers of ships, or into shipwrecks or other casualties affecting ships:

Be it enacted by the Queen's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same as follows:

1. *Short Title.*—This Act may be cited as the Merchant Shipping (Colonial Inquiries) Act, 1882.

2. *Construction of Act.*—This Act shall be construed as one with the Merchant Shipping Act, 1854, and the Acts amending the same, and the said Acts and this Act may be cited collectively as the Merchant Shipping Acts, 1854 to 1882.

3. *Colonial courts or tribunals to have jurisdiction to make inquiry into charges of misconduct or incompetency and shipping casualties in certain cases occurring outside the limits of the colony.*—Every court or tribunal which is already authorised or which may hereafter be authorised by the legislative authority in any British possession to make inquiry into charges of incompetency or misconduct on the part of masters, mates, or engineers of ships,

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or as to shipwrecks or other casualties affecting ships, shall in the cases following ; that is to say,

1. When the incompetency or misconduct has occurred on board of a British ship on or near the coasts of the British possession or on board of a British ship in the course of a voyage to a port within the British possession :
2. When the incompetency or misconduct has occurred in any part of the world on board a British ship registered in the British possession :
2. When the shipwreck or casualty occurs to a British ship on or near the coast of the British possession or to a British ship in the course of a voyage to a port within the British possession :
4. When the shipwreck or casualty occurs in any part of the world to a British ship registered in the British possession :
5. When the master, mate, or engineer of a British ship who is charged with incompetency or misconduct on board of such British ship is found in the British possession :
6. When some of the crew of a British ship which has been wrecked or to which a casualty has occurred are found in the British possession :

wherever the incompetency, misconduct, shipwreck, or casualty has occurred, have the same jurisdiction as such court or tribunal would have had if such incompetency, misconduct, shipwreck, or casualty had occurred within the ordinary jurisdiction of such court or tribunal, but subject to all provisions, restrictions, and conditions, which would have been applicable if they had so occurred : Provided that no inquiry shall be held under this Act into any shipwreck, or other casualty, or charge of incompetency or misconduct, which has once been the subject of such an inquiry and has been reported on by any competent court or tribunal in any part of Her Majesty's dominions, or in respect of which the certificate of a master, mate, or engineer has been suspended or cancelled by a naval court; and provided also, that where any inquiry has been commenced in the United Kingdom no inquiry shall be made in the same case under the authority of this Act in any British possession.

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In all the above the "British Possession" shall mean the British possession by the legislative authority whereof the court or tribunal is authorised to make inquiry.

4. *Colonial legislative authorities empowered to authorise inquiries into shipping casualties and charges of misconduct and incompetency in certain cases.*—The legislative authority in any British possession is hereby empowered to authorise courts or tribunals to make inquiries in the cases enumerated in the last preceding section of this Act into charges of incompetency or misconduct on the part of masters, mates, or engineers of ships, or as to shipwrecks or other casualties affecting ships, subject to the provisions in the last preceding section of this Act mentioned.

5. *Suspension or cancellation of certificates.*—The powers of suspending or cancelling the certificate of any master, mate, or engineer of a ship conferred by the provisions of the Merchant Shipping Acts, 1854 to 1880, upon or after any inquiry or investigation held under the provisions of the said Acts, shall be applicable to and be exercised upon or after any inquiry by any court or tribunal authorised by this Act, or authorised by the legislative authority of any British possession under the powers conferred by this Act. Such power of suspension or cancellation shall be exercised by the court or tribunal holding the inquiry in the manner provided by section twenty-three of the Merchant Shipping Act Amendment Act, 1862, and the Board of Trade shall in such cases have all the powers conferred upon them by the said section.

6. *Repeal of part of* 17 *and* 18 *Vict., c.* 104, *s.* 242.—The words "and such report is confirmed by the governor or person administering the government of such possession" in case (V.) of the cases enumerated in section two hundred and forty-two of the Merchant Shipping Act, 1854, are hereby repealed, and this repeal shall be deemed to take effect as if the said words had been expressly repealed by the Merchant Shipping Act Amendment Act, 1862. The confirmation of the report required by the said words shall be deemed to have been no longer necessary after the passing of the Merchant Shipping Act Amendment Act, 1862, as a condition precedent to the suspension or cancellation of the certificate of any master, mate, or engineer.

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NOTICE TO CANDIDATES FOR MASTERS' CERTIFICATES OF COMPETENCY.

Cyclones or Revolving Storms.

Board of Trade, Marine Department, June, 1882.

In a recent inquiry into the loss of a vessel, it was recommended by the Court that persons applying for Masters' Certificates of Competency should be more particularly examined as to their knowledge of the Law of Storms. The Board of Trade therefore give notice that on and after the 1st September, 1882, this subject will form part of the examination in Navigation of all Applicants for Masters' Certificates of Competency for the Foreign Trade, who will be required to give written answers to the questions on the other side hereof.

Candidates will be allowed half an hour to answer these questions in addition to the time prescribed, for the completion of their Navigation, in the Regulations (Exn. 1).

After the 1st day of September 1883, these questions will also have to be answered by Applicants for Certificates as 1st Mate or only Mate.

T. H. Farrer, Secretary.

Thomas Gray, Assistant-Secretary.

Questions Relating to Cyclones or Revolving Storms common in Tropical Seas.

An Applicant for a Master's Certificate for Foreign-going Vessels must answer in writing, on paper supplied to him by the Examiner, the following Questions, numbering the answers to correspond with the Questions.

Question—

1. The direction of wind in a Cyclone being*————————, state the probable bearing of its centre from the ship in the *————————Hemisphere.
2. And suppose that the wind during the passage of the same cyclone were found to change toward the*————————,

* These spaces to be filled in by the Examiners, and frequently varied.

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what would be the ship's position with reference to the line of progression of the centre of the cyclone, and what action would you take?

8. Under what conditions would the change in the direction of the wind in the cyclone be the reverse of the above?
4. What are the usual indications of a ship being on the line of progression of the centre of a Cyclone?
5. What are the usual indications that a ship is *(a)* approaching the centre of a Cyclone; *(b)* receding from it?
6. Describe the track usually taken by cyclones in the †————————, and state the seasons of the year in which they most frequently occur in that region.

Official Inquiries at Home, 1882.

1414. *Falls of Afton*, four-masted ship; built at Greenock, 1882; owned by Mr. M. Breakenridge and others; tonnage, 1,899; Glasgow to Calcutta; railway iron, sleepers, and coals; abandoned at sea, April 28, 1882, but subsequently boarded and taken into Madeira by a French vessel. Inquiry held at Westminster, July 1, 1882, before Rothery, Wreck Commissioner; Kennedy, Parish and Robinson, N.A. Master guilty of grave misconduct in allowing the sluice in the collision bulkhead to remain open, and in cutting the suction-pipe in the after-peak, and turning the water on into the hold. Vessel improperly and prematurely abandoned. Master's certificate cancelled.

1416. *Vesper* and *Billow*, fishing vessels; the former built at Sandwich, 1862; owned by Mr. G. J. Dent; tonnage, 46; the latter also built at Sandwich, 1858; owned by Mr. B. Wells; tonnage, 40; engaged fishing; in collision off Lyit Island, Denmark, when the *Vesper* foundered, June 11, 1882. Inquiry held at Hull, July 15, 1882, before Twiss, Judge; Moresby and Rees, N.A. Collision due to no look-out being kept on board the *Billow*.

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† The Examiners to fill in whether North Atlantic, Bay of Bengal, China Seas, Indian Ocean, &c., &c.

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1417. *Joshua Nicholson*, s.s.; built at Willington-on-Tyne, 1880; owned by Mr. C. Tully; tonnage, 1,195; London to the North; ballast; stranded south of Seaham Harbour, June 26, 1882. Inquiry held at North Shields, July 18, 1882, before Green and Baker, Justices; Ward and Murdock, N.A. Master in default for not ascertaining true position of ship when off Whitby and for neglecting the soundings. Certificate suspended for three months.

1422. *Roseneath*, barque; built at Quebec, 1873; owned by Mr. J. S. Hatfield and others; tonnage, 622; Mexillones to Liverpool; guano; abandoned at sea, May 12, 1882. Inquiry held at Glasgow, July 19, 1882, before Young and Sharp, Justices; Grant, Ward and French, N.A. Abandonment justifiable, but Court censured Master for not having his boats, &c., put in thorough repair before going to sea.

1424. *Falcon*, s.s.; built at Low Walker, 1876; owned by General Steam Navigation Company; tonnage, 351; Granton to London; general cargo and passengers; damaged by striking the Bass Rock, Firth of Forth, June 28, 1882. Inquiry held at Westminster, July 19, 1882, before Rothery, Wreck Commissioner; Parfitt and Vaux, N.A. Master in default for negligent navigation in steering a course in thick weather, dangerously near the Rock. Certificate suspended for six months; recommended for one as mate.

1425. *Orianda*, s.s.; built at Liverpool, 1879; owed by Mr. D. Richards and others; tonnage, 980; Elba to United Kingdom; iron ore; stranded near Cape St. Vincent, April 29, 1882. Inquiry held at North Shields, July 19, 1882, before Spence and Robinson, Justices; Rees and Hyde, N.A. Master guilty of negligent navigation. Certificate suspended for three months.

1426. *Athlete*, s.s.; built at Bristol, 1855; owned by Mr. J. J. Wallace; tonnage, 230; Bilbao to Swansea, iron ore; abandoned at sea, May 20, 1882. Inquiry held at Westminster, July 20, 1882, before Rothery, Wreck Commissioner; Beasley, Comyn, and Hallett, N.A. Casualty due to defective machinery and insufficient supply of coals. Master to blame for not accepting the services

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of a tug which offered to tow him to Falmouth. Certificate not dealt with.

1427. *Douro*, s.s., and *Yrurac Bat*, s.s.; former built at Greenock, 1865; owned by Royal Mail Steam Packet Company; tonnage, 1,803: of the latter no particulars are forthcoming; in collision off Cape Finisterre, April 1, 1882, when the *Douro* foundered and loss of life ensued. Inquiry held at Westminster, July 8, before Rothery, Wreck Commissioner; Knox and Methven, N.A. Accident caused by *Douro* not taking proper steps to keep out of the way of *Yrurac Bat*.

1429. *Seagull*, s.s.; built at North Shields, 1877; owned by Mr. J. Steel and another; tonnage, 27; Port Ellen, Islay, to West Loch Tarbert; carrying mails and passengers; damaged by striking a rock at the entrance of Gigha Harbour, July 1, 1882. Inquiry held at Glasgow, July 28, 1882, before Inglis and Swan, Justices; Wilson and Anderson, N.A. Master to blame for unskilful navigation. Uncertificated.

1435. *Fisher*, barque; built at Prince Edward's Island, 1857; owned by Mr. James Graham; tonnage, 298; the Tyne to Stockholm; coals; supposed to have foundered at sea. Inquiry held at North Shields, July 31, 1882, before Spence and Robinson, Justices; Burney and Harland, N.A. No evidence as to cause of loss.

1439. *Virago*, s.s.; built at Hull, 1871; owned by Messrs. T. Wilson and Sons; tonnage, 1,470; Hull to Odessa; general cargo and coals; supposed to have foundered at sea. Inquiry held at Hull, August 9, 1882, before Twiss, Judge; Knox and Castle, N.A. No evidence as to cause of loss. Vessel seaworthy when leaving Hull.

1442. *W. D. C. Balls*, s.s.; built at South Shields, 1878; owned by Mr. W. D. C. Balls; tonnage, 802; the Tyne to Leghorn; coals; lost on a sunken rock off Cape De Gata, June 11, 1882. Inquiry held at North Shields, August 8, 1882, before Spence and Jackson, Justices; Curling and Kennedy, N.A. Accident caused by master hauling the vessel close in shore to avoid heavy head-wind and sea. Guilty of error of judgment. Severely reprimanded.

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Official Inquiries Abroad, 1882.

1413. *Pera*, s.s.; foundered at sea, June 10, 1882. Inquiry held at Quebec, June 16, 1882. Casualty caused by collision with an iceberg during thick weather. Master free from blame.

1415. *Blodwen*, s.s.; stranded on a reef east of Romsoe, Great Belt, June 5, 1882. Naval Court held at Copenhagen, July 4, 1882. Master guilty of error of judgment. Certificate returned with a caution to be more careful in future.

1418. *Star of India*, barque; beached and abandoned south of Valparaiso, May 14, 1832. Naval Court held at Valparaiso, May 30, 1882. Master seriously to blame for making no effort to discover whereabouts of leak and for beaching the vessel without sufficient cause. Certificate suspended for one year.

1419. *Gleam*, barque; lost at Port Nolloth, South Africa, April 3, 1882. Inquiry held at Cape Town, April 22, 1882. Master to blame for bringing up in a dangerous position and for not having had a slip rope made fast to the cable before heaving short. Certificate suspended for one year.

1420. *Seafield*, barque, and *Roxburgh*, s.s.; in collision at East London, May 27, 1882. Inquiry held at East London, June 2, 1882. *Roxburgh* in default.

1421. *Escambia*, s.s.; lost on the Bar, San Francisco, June 19, 1882. Naval Court held at San Francisco, June 22, 1882. Master free from blame. Accident due to perils of the sea.

1423. *Clansman*, schooner; lost at East London, May 31, 1882. Inquiry held at East London, June 6, 1882. Parted anchor. Master free from blame.

1428. *Coorong*, s.s.; stranded near Curdies Inlet, April 26, 1882. Inquiry held at Melbourne, May 10, 1882. Master to blame for steering a course too close to the land. Certificate suspended for six months. Mate to blame for neglecting to call the master when weather became thick. Certificate suspended for six months.

1430. *Knight of St. Patrick*, s.s., and *Abdool Rahamanee*, dhow; in collision off Dhabul, May 14, 1882. Inquiry held at Bombay, June 1, 1882. Accident caused by dhow carrying no light.

1431. *Ladybird*, s.s., and *Wakatu*, s.s.; in collision in Wellington

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Harbour, April 26, 1882. Inquiry held at Wellington, May 17, 1882. Collision consequent upon the *Ladybird* being brought into harbour at too great speed. Master censured.

1432. *Mary Tatham*, s.s.; lost at Cape Yerimo, Japan, April 10, 1882. Naval Court held at Hakodate, June 7, 1882. Loss occasioned by the use of an incorrect chart and by action of northerly current.

1433. *Lammermoor*, ship; lost on Bodega Rock, coast of California, June 27, 1882. Naval Court held at San Francisco, July 6, 1882. Master to blame, in that on the second officer sighting the land, and hauling the ship off, he ordered her to be kept on her former course. Certificate suspended for six months.

1434. *Bessie H.*, barque; damaged and sunk in Monte Video Bay, June 7, 1882. Naval Court held at Monte Video, June 19, 1882. Vessel dragged her anchors and came in contact with some unknown object. Master free from blame.

1436. *Fairlight* and *Osprey*, s.s.; in collision off Fort Macquarie, June 6, 1882. Inquiry held at Sydney, June 12, 1882. Master of *Fairlight* to blame. Certificate suspended for one month.

1437. *Helen*, s.s.; lost near Carpenter Rocks, February 9th, 1882. Inquiry held at Port Adelaide, April 6, 1882. Loss due to incompetence of Master. Uncertificated.

1438. *Empress of China*, schooner; damaged by striking a rock on King Island, May 11, 1882. Inquiry held at Port Adelaide, June 13, 1882. Master somewhat blameworthy. Certificate not dealt with.

1440. *Carisbrooke*, s.s., and *Melanope*, ship; in collision at mouth of Rangoon River, May 6, 1882. Inquiry held at Rangoon, May 15, 1882. Master of *Melanope* guilty of error of judgment in misjudging strength of tide when attempting to cross steamer's bows.

1441. *St. Albans;* lost in Long Bay, May 17, 1882. Inquiry held at Sydney, May 29, 1882. Master in default for navigating his vessel too close in shore, and for going to sea short handed. Certificate suspended for three months.

1443. *Catherine Leed*, barkantine; lost on a reef off the Bahamas, May 17, 1882. Inquiry held at New Providence, May 29,

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1882. Accident due to careless observations by master. Censured.

1444. *Christina*, brigantine; lost in Plettenberg Bay, May 16, 1882. Inquiry held at Kysna, June 8, 1882. Casualty due to an error of judgment on the part of the pilot in charge.

GENERAL.

ARCTIC VOYAGING AND RETURN OF MR. LEIGH SMITH.—In our August number, we incidentally mentioned in connection with "Polar Research" the detention of the yacht *Eira*, with Mr. Leigh Smith and his crew, in the Arctic Ocean, probably in the vicinity of Franz Josef Land, and the departure of Sir Allen Young, in the *Hope*, as a relief expedition. While going to press, news has arrived of the fate of the *Eira* and the return of Mr. Leigh Smith with Sir Allen Young. The following telegram briefly narrates events, in which many of our readers feel an interest:—

"August 19, ss. *Hope*, at Peterhead.—The steam whale ship *Hope*, 500 tons, chartered by the *Eira* Relief Committee, under the command of Sir Allen Young, C.B., has arrived at Peterhead, bringing home Mr. B. Leigh Smith, the officers, and crew of the missing Arctic exploring ship *Eira*, all of whom the *Hope* had picked up at Matotchkin Straits, Nova Zembla, on the 3rd of August, they having lost their ship in Franz Josef's Land, and returned in their boats through the ice to the above Straits. On July 13, 1881, the *Eira* steamed north through the pack ice. On the 23rd of July she sighted Franz Josef's Land, and went towards Cape Ludlow. There was a close pack to the north. On August 2 they went up to Nightingale Sound, and then to Eira Harbour, and put up a store house. On August 16 they started east to look for the *Jeannette*, but could not pass Barents Hook. On August 21 they got nipped between land floe and pack one mile east of Cape Flora, and sank before many stores were saved. They built a hut on Cape Flora of turf and stones, covered with sails, and there wintered, without any symptoms of

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scurvy appearing. Twenty-nine walrus and 36 bears were killed and eaten. They left on June 21, 1882, in two whale boats and two walrus boats, sailed 80 miles south without seeing any ice, and reached Matotchkin Straits, Nova Zembla, on August 2, where they were picked up by the steamship *Hope* on August 3."

Disturbance of the Sea at Scilly.—Mr. W. Thomas, Meterological Office Reporter at Scilly, writing to Mr. Robert H. Scott, F.R.S., Secretary to the Meteorological Council, under date July 14, 1882, says:—"I beg to inform you of a curious disturbance of the sea, at 9 a.m. yesterday, July 13, about low water, the wind S.S.W.: the water flowed rapidly up to three feet perpendicular, and then ebbed out again. It flowed and ebbed three times; the second and third time was not so high as the first. From the first to the last was about half an hour."

Cirrus Clouds.—The intimate connection of cirrus clouds with bad weather and cyclones is well known, and at the meeting of the International Meteorological Committee at Copenhagen in August it was resolved that M. de Brito Capello, Rev. Clement Ley, and Professor Hildebrandsson be requested to draw up a scheme of instructions for the observation of these clouds. We shall take care that our readers are apprised of these instructions as soon as they are formulated.

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THE

NAUTICAL MAGAZINE

FIFTY-FIRST YEAR.

VOLUME LI.—No. X.

OCTOBER, 1882.

THE STABILITY OF MERCHANT VESSELS.

WE have often endeavoured to impress upon shipmasters and shipowners the fact that sufficient attention is not paid by them to stability as an element of seaworthiness, and that to a very large extent ships are still stowed by guess-work; not even under the direction of a master or mate who has had experience of the behaviour of the vessel at sea, but by a stevedore, who may or may not know anything about her. For instance, in stowing a cargo of iron rails, the rough rule of placing one-third in the 'tween-decks will frequently be carried out with no regard at all to the dimensions or form of the particular vessel.

We are glad therefore to find the *Shipping and Mercantile Gazette* taking up the question and enforcing upon shipowners the importance of a part of their business, we might say duty, which has in the past been too often neglected. That experienced stevedores do perform their duties, if not with a thorough knowledge of the scientific conditions which determine a ship's behaviour at sea, at least in the light of such practical information and judgment as in most cases leads to equally good results, will of course be readily granted. The essential weakness of the whole

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business is, however, that as with progress in naval architecture the designs of ships alter, the mere empiric stevedore finds his past experience leading him altogether astray in dealing with vessels of a new type.

While, however, we believe that good must result from attention being directed to a subject which has been, and is still too much neglected, we cannot altogether agree either with all the statements or all the conclusions of the *Shipping Gazette*. We do not, for instance, think that in the year of grace, 1882, many shipowners, who know anything of their business, fall into the error of supposing "that the prevention of overloading, by simply fixing a minimum height of side out of water, is a sufficient guarantee that a vessel will not be loaded in an unseaworthy manner." In correction of this supposed common error we are further told that in loading a ship "there are two points to consider, one that she is not immersed too deeply, the other that the cargo is so placed as not to have too high a centre of gravity." The practical stevedore does not require any science to teach him that there are two other equally important considerations, quite as much affecting the safety of the ship. He knows that the centre of gravity may be too low as well as too high, and he also is aware of dangers from cargoes not properly secured as great as those resulting from overloading.

The writer in the *Shipping Gazette*, however, appears to have set himself to prove or rather to enforce the overwhelming importance of ascertaining stability at various angles of inclination, as expressed by the curve of stability, rather than initial stability as measured by the metacentric height. Some years ago it was the practice of naval architects generally to use the metacentric height as the sole measure of stability; the introduction of a class of vessels into the Royal Navy having low freeboard, and consequent deficiency of range of stability, led to a more general consideration of the latter condition, and since that period quite its due share of importance has been attached to the question of range. The writer, with whom we are dealing, tells us, that before any opinion can be formed as to what a ship's stability is, it is necessary to calculate it for various angles of inclination.

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and thus ascertain the manner in which it varies as she inclines, at what inclination the righting moment is greatest, and when it vanishes altogether and the ship would capsize. In thus insisting upon the importance of range of stability he even goes so far as to say that "the metacentric height is almost valueless as a measure of safety."

Sometimes it may be valueless taken by itself; it does not in any case tell us everything; but generally speaking what it does tell is the most important thing to be known. Naval architects have always had good ground for holding that in the majority of ships the metacentric height is a sufficient practical measure of the stability, and it is only in vessels of exceptional type that more is wanted. One such exceptional type is found in the low freeboard ironclads of large breadth in proportion to depth, and indeed the disastrous loss of one of them, due to a want of knowledge of her weak points, gave prominence to the whole question of range of stability as distinct from metacentric height.

While it is quite true that no excess of metacentric height will compensate for low range, it may be also laid down that no excess of range can altogether compensate for deficiency in initial stability. In the class of ships referred to by the *Shipping Gazette*, the narrow and deep vessels with double-bottoms, which in some cases are unfit to carry grain or coal cargoes with the ballast tanks empty, the question of range of stability does not affect seaworthiness nearly so much as does the deficiency of metacentric height. Many vessels of this class have foundered at sea, and no one has survived to tell the tale, but there have been instances where enough has been known of the loss to enable us to fix its cause. When a vessel which has, at small angles of inclination stood up well under a heavy press of sail, but being caught by a squall has suddenly capsized, we know that the fault has been a deficiency of range of stability; but when, as in some cases which have been the subjects of wreck enquiries, we hear of a steamer leaving port with a slight list, of that list gradually increasing when she gets into bad weather, and the cargo shifting more and more, it may not matter much at the last whether she actually capsizes, or whether having stability up to

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ninety degrees she gets over on her beam ends, and the sea breaking in her hatches she ultimately founders.

A first condition of seaworthiness, we must repeat, is that the ship must be stowed so as to have a fair amount of initial stability. However well cargo may be stowed and secured, there are and must be certain weights in the vessel which can alter their position, and will do so if in consequence of her low initial stability she is easily put over, and remains at extreme angles of inclination. No seaman needs to be told that a large list is in itself a source of danger, even if the vessel be of such form that it is hardly possible for her to turn turtle.

As an illustration of the quantitative value of increased metacentric height in increasing the range of stability, we may refer to some figures given by Mr. Martell in a paper on the subject of the stability of merchant steamers. In dealing with vessels which he supposes to be dangerous because of their small range, his extreme example is a three-decked steamer, so loaded as to have only a metacentric height of ·7 feet. Her maximum stability is at an inclination of 25° and at an angle of 51° her stability vanishes. The very same vessel under altered conditions of stowage, with a metacentric height of 1·2 feet does not attain her maximum stability till she is at an angle of 32°, and her stability does not vanish till 76°.

The metacentric measure of freeboard is, as we have said, of least service in the case of vessels of large beam in proportion to depth, for the simple reason that at but moderate angles of heel the edge of the deck is put under water. Such extreme proportions now obtain in the large sailing ships of which so many have been built within the last year or two. In some of them the depth is little more than half the breadth, and a curve of stability would give evidence of the fact that soon after the edge of the deck is under water the stability decreases with alarming rapidity. In this regard a watertight bridge-house amidships is most valuable in lengthening out the range of stability, whereas deck erections at the ends of the vessel, where she of course is narrower, are but of little service in increasing her stability.

A large sailing ship recently built for a Liverpool firm, the

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Muncaster Castle, has, instead of a poop and forecastle, a bridge-house amidships with watertight doors and open turtle-backs forward and aft; we should think that, with the large beam now given to sailing ships, this arrangement may be often adopted with great advantage in respect of stability.

We do not think it is necessary to have a curve of stability got out for every new design, but we do think it desirable that some calculations should be gone into with a view of ascertaining the metacentric height under conditions of loading where it is likely to be least. The simplest method is to incline the ship when at her load draught with a uniform cargo, such as coals, on board, or at least a cargo of which the centre of gravity can be known. From the result so obtained it is easy to approximate to the condition when the cargo is one of such specific gravity that it becomes a question whether ballast is required. If the result show that ballast is required, then a part of the instructions to the master would be to keep the water ballast tanks full when such a cargo was taken. In vessels of large freeboard, such as awning and spar-deck ships, the information given by the metacentric height is usually all that is wanted, in three-deck ships it may be desirable to have a curve of stability got out, and also in vessels of exceptionally large beam where there is great initial stability, but in which it can be seen that the stability decreases rapidly at comparatively small angles of inclination.

In recommending some years ago that freeboard should depend upon beam, the Council of the Institution of Naval Architects, if they committed the common error of putting forward a partial solution of the question as a complete one, yet indicated the truth that no settlement of freeboard can be complete which does not take in stability. Many vessels are certain for other reasons to have a sufficient range of stability, but in some this should be the limiting condition of minimum clear side. The Council of the Institution fixed upon one-eighth of the beam as a measure of freeboard, which is about the same as requiring that a vessel should not bring the edge of her deck to the water at a smaller angle of inclination than 14°.

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THE NAVAL OPERATIONS AT ALEXANDRIA.

IT is not the province of seamen to enter into political questions, but the circumstances connected with the Egyptian imbroglio render such action pardonable. For many years a great authority has upheld the doctrine that individual races should live under laws of their own making and work out their own destiny. It commenced with the amalgamation of the Greeks in the Ionian Islands with the parent stem, and from that day to the present hour the Turk has had a bad time of it, the majority of changes and rounding of territories having been made at his expense. Our ministry were doubtless under the impression that the parade of ironclads before the maritime capital of Egypt would scare Arabi and his colonels as it did the Sultan at Dulcigno. The error has cost us dear. It will be well if endless complications and claims for indemnification do not hereafter arise. Notwithstanding that it was long since laid down that British subjects who settled in a foreign country were not to be indemnified for losses arising from foreign wars or internal troubles, other nationalities may not adopt the principle in its entirety. Save for the protection of the Suez Canal it is difficult to understand in what manner the national interests were compromised by the action of Arabi, and it may be asserted with confidence that neither a Liberal or a Conservative Ministry will ever enter on a similar crusade. If it is a bondholders' war then we can understand why it is waged. If not, why is one policy pursued in Egypt and another of a totally different nature elsewhere. Had a single Egyptian battalion threatened the safety of the Canal, it would have been the duty and the interest of England to have come forward without a moment's delay. It may be safely predicted that under such conditions she would not have stood alone; all maritime nations are interested in the important waterway. If it were even temporarily blocked the whole of the commercial world would feel the blow. To talk of reverting again to the old route around the Cape of Good Hope is arrant nonsense. It would sound equally sensible to talk of arming the

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rifles or the marines with the crossbow. When civilization has once seized on an innovation it never retrogrades. The luxury of one lustre is the necessity of the next, whether it assumes the form of superior locomotion or one of those innumerable amenities of civilized life which are constantly coming to the front. There are reasons for inferring that Admiral Seymour would not have been invested with such ample powers if it had been thought he would carry them into effect. If what has been carried out was really contemplated, it is difficult to understand on what grounds, after the appearance of the fleet at Alexandria, one shovelfull of earth was allowed to be added to the fortifications. Day after day and night after night swarms of men were engaged in strengthening the half-completed modern works, until little but the mounting of rifled ordnance was required to make the sea-face of the city one of the most formidable in the Mediterranean. The sending of the fleet was either practically a declaration of war or a manœuvre calculated to make England the laughing stock of Europe. The English Admiral at any cost acted in a manner which effectually disposed of the last contingency. If war was resolved on, the omission to provide for the safety of the city when the ships had destroyed the batteries cannot be too deeply regretted. The case was not unique, Paris and Lima in our own time have shown that the most formidable enemies to a prosperous city are the *canaille* which infest its purlieus joined with their *confrères* in neighbouring towns. It has been stated that immediately the wires flashed the intelligence of the strike of the Dublin police, all the scum of outlying villages flocked in to participate in the anticipated looting of the wealthy. Ask those, whose intimate knowledge of the criminal classes in London entitle them to be judges, what the fate of the city would be if denuded of its regular protectors and left to the mercy of the roughs; nothing recorded in history would lead up to such scenes as would be enacted. After the experience gained by the Dublin *émeute* it would be well to have a force of special constables ready for an emergency, for in this particular instance legal difficulties at first caused delay on the part of the Government, and the civic authorities, after much recrimination and the issuing of a fulsome and ridiculous proclamation, refused to act until their

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services were not required. We should take a hint from this and have a respectable force of citizens ready to meet an emergency. It would be like making a man's will; no one dies the sooner for it. However, forethought has not in recent times been the characteristic virtue of the heads of departments, and it is not, therefore, probable that the suggestion will ever be utilised.

There is one satisfactory deduction to be drawn from the action of the fleet, we now know exactly their true value as fighting machines. Before the ships were subjected to the actual test of warfare, their capabilities were a matter of dispute amongst those whose scientific and practical acquirements entitled them to be heard with respect. It has proved to the world, as the writer anticipated it would, that the granite defences of Gibraltar are unequal to the task of contending with an ironclad, furnished with the heavy guns now in use. From the peculiar formation of the rock even bad gunnery must prove formidable, the more so from the fact, that, owing to the depth of water, any position could be taken up. Every shell from the ships would tell a tale of destruction, but a moving object is so difficult to hit when enveloped in smoke, that at a long range the odds would be incalculably in their favour. Alexandria has, it is to be hoped, brought another weak link in our armour prominently into notice. There was not a single gunboat proper present. The *Condor* and *Bittern* are wooden vessels which a single well directed shell might have annihilated or disabled; they engaged the batteries within easy range, and nothing but the extraordinarily bad gunnery of the Egyptians saved them from such a fate. The royal braces of the *Condor* were shot away, a sufficient proof that a want of skill on the part of the enemy in judging distance had much to do with their immunity from damage. It is easy to imagine how serviceable a few light draught armoured gunboats would have been on this occasion. They might have chosen their position, and by keeping end on offered so small a mark for the opposing gunners as to render their escape from injury almost a certainty. The writer has heard his father relate how the gallant Danes in one of their praams once severely mauled a seventy-four gun ship in which he served. They were hulled on several occasions, and had not a breeze sprung up

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it is difficult to say where their loss would have ended. Draught of water is an important factor in a fighting ship, extremely so in a port like Alexandria. One commanded by an officer who has no superior in Her Majesty's Service (H. F. Nicholson) did take the ground and remained fast for some time. Had a single powerful gun succeeded in getting her range, the consequences might have been disastrous amongst those who were necessarily exposed in laying out anchors, &c., working on deck.

By the following remarks it is not intended to unfavourably criticise the tactics followed by the squadron before Alexandria. The fleet did their work effectually, had but little loss, and showed those who were croaking about the imaginary superiority of the French in naval armaments, that the grounds for their fears rested on a very indifferent foundation. France has sufficient to occupy her attention on the frontiers without attempting to rival England on the ocean. An unsuccessful war with this country would, notwithstanding her great resources, reduce France to bankruptcy. All sensible Frenchmen are fully aware of this fact, and treat with unmitigated contempt the wild Chauvinism of a few obscure journals. With these facts patent to Europe it is, as was stated in a former article, unworthy of officers holding high naval rank to attempt to prove in the press and elsewhere that England is deficient in ordinary ironclads. We are not, as Sir Thomas Brassey recently announced, vulnerable in that quarter, but in one which scarcely a single ship in the Navy is fit to protect. If this be not well looked to now danger does not loom on the horizon, British commerce will find itself in a position not unlike that of Sir Garnet Wolseley at Ismailia ; the mules which ought to have been on the spot were being hunted up in the remote countries of the New World.

In one arm, the transport service by sea, the magnificent Mercantile Marine of this country places her in advance of the times. When one remembers the quaint transports at Varna, and then looks at their modern representatives in the Suez Canal, it is impossible to avoid being struck with admiration at the energy and enterprise that without State aid has produced ships, which are the admiration and the envy of the civilized world. We

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must not, however, be too ready to lend an ear that it is possible to convert these beautiful specimens of naval architecture into effective men of war. There is not one whose machinery and boilers are below the level of the water line, and with such a prominent defect no steamer is safe to fight a regular action. There is a marked difference between cruising to destroy or capture a defenceless merchant ship, and cruising to protect them from the privateers of the enemy. The Treaty of Paris, owing to the enrolment of commercial ships in Imperial marines, has practically become a dead letter. Captures will be made, as they always have been made, by nations who possess efficient ships for the purpose, quite regardless of the real or nominal ownership.

This has been, in a certain sense, a digression from the regular line of incident, but circumstances rendered it necessary. Everyone acknowledges the bravery with which the ships were fought. But there are indications that, as a whole, science was neglected in gunnery or seamanship. From the published reports we learn that shells from the guns of the *Inflexible* were found six miles from the position she occupied during the bombardment. As the sea was smooth at the time, the elevation or the range must have been singularly inaccurate. In the heat of action, apart from the obscuration of objects by smoke, the accuracy necessary for delicate observations with the sextant is more than questionable. That this method was resorted to is evident from the sketch of the bridge of H.M.S. *Alexandra* at the moment she was struck by a shell. Now, as everything depends on accuracy of range in shell firing, it is surprising that other means than the sextant were not resorted to for the purpose of attaining it. To lay down buoys would simply enable an enemy to ascertain by a few shots the exact distance of the ships in passing their locality, and such a method may be at once condemned as unsafe. But there is nothing on that coast to prevent a vessel being anchored out of gunshot in the offing, with a second in position to form a line of bearing to steam on. As the bombardment extended over many hours this line of bearing, and consequently the range, might have been altered by removing the inshore mark. Midshipmen were stationed in the tops to report where the shells fell, a proof that

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it was possible to con the ships from the same spot, leaving those on deck to watch the steerage and keep station. The distance of the fort or battery could then be accurately measured from any desired position and the gun laid accordingly. It is incidents of this nature which indicate that seamanship will yet be of value in battles at sea. In this particular instance local difficulties might have prevented the above suggestions from being carried into practice, notwithstanding the open water. However, the chart does not show anything in the way, and those who were not present have nothing else to aid their judgment. There is much to be thankful for in the fact that the forts had only a few rifled guns in position. The smooth bores have neither the penetrating power or accuracy in firing of the rifled weapon; hence, when their missiles struck the plating of the ironclads few came through or inflicted material injury.

From the experience gained before Alexandria the sceptical are convinced that the most formidable of ships' guns have no chance on equal terms against batteries protected by earthworks. We frequently read how greatly the experts were disappointed at the little effect produced by the shells of the eighty-one ton guns exploding amidst sandbags. On the other hand, it is equally evident that granite was smashed as easily as crockery, while the splinters must have added to the havoc wrought by direct impact. With such established facts to guide us, it is evident that we must look to the condition of some of the recent fortifications at home. Of what possible use is the granite fort on the west end of Plymouth Breakwater? Of its *vis-à-vis* in the face of the Edgcumbe Cliff, which appears to be specially constructed as a shell trap? Of Drake's Island, with its old-fashioned bastions and curtains of crumbling stone, sufficiently powerful perhaps to resist the guns of a frigate of the old school, but powerless against those now in use on the ships of all the great maritime powers? Of what use, save as pilotage marks, are those singular-looking structures on the Norman and Horse Sands? Not even an iron casing will render them equal to the task for which they were constructed. Of what use is the circular sandstone fort at the mouth of England's greatest shipping

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port, the loyal city of Liverpool? Its time-stained walls appear scarcely sufficiently massive to mount a saluting battery, yet does it represent the sole means of defence of the second city of the Empire. Such neglect is contrary to the rules of military prudence, for circumstances not unfrequently crop up as unexpected as they are formidable. W.

PROFESSOR FERREL ON CYCLONES.

IN the September number of the *Nautical Magazine* in connection with a notice of the "United States and Geodetic Survey-report for 1878," we incidentally drew attention to Professor W. Ferrel's meteorological researches bearing on the subject of "cyclones, tornadoes, and waterspouts." As a knowledge of the "law of storms" now forms part of the examination of candidates for the master's certificate, it is of importance that the parties most interested in this department of meteorology should be well posted in the latest views respecting cyclones, and to this end we give an abstract of such parts of Professor Ferrel's paper as may be most useful in inducing such candidates to read up the subject of examination. This is more especially necessary since the majority repudiate the idea of the incurvature of the wind in a cyclone as a pure hypothesis in contradistinction to the circular rotation, into which view they have for years been indoctrinated.

Professor Ferrel has investigated the subject from the twofold standpoint of (1) theory, and (2) the practical applications of the theory and comparisons with observations. In the first of these, embracing as it does much abstruse mathematical investigation the general reader and the navigator will, unless well read in mathematics, take but little interest. It is sufficient therefore to say that in dealing with the mechanical theory of cyclones the elements considered are the earth's rotation and its effect on the movements of the atmosphere, the gyratory velocity of the wind around the centre of depression, the friction, the inertia,

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and the temperature and humidity of the air. The Professor aptly concludes the theoretical investigation into the mechanics of cyclones by an illustration of the causes of their motion over the earth's surface.—

"So far we have regarded the cyclones as existing in an atmosphere having no motions excepting those belonging to the cyclones. But on account of the general motions of the atmosphere (treated of in the first part of these researches) cyclones usually occur in an atmosphere having a general motion independent of those of the cyclone itself. In order, therefore, to have the true motions relative to the earth's surface, we must take the resultant of the two motions. In the middle and higher latitudes of the northern hemisphere the general or normal motion of the air is from the west or south-west. In a cyclone in these latitudes this motion of the air coincides with that of the southern side of the cyclone, and increases the motion relative to the earth's surface, but on the northern side it is in the contrary direction, and counteracts in some measure that of the cyclone, or it may even entirely destroy it. On the east or north-east side of the cyclone and its opposite, this general motion from the west or south-west would have little effect upon the velocity relative to the earth's surface, but would affect mostly the *inclination*, that is, the angle between the tangent to the isobar and the direction of the wind, decreasing it on the east or north-east side of the cyclone and increasing it on the west or south-west side.

"In the latitude of the trade-winds, where the general or normal direction is from the east or north-east, the reverse takes place, so that the velocities of the air belonging to the cyclone are diminished or, it may be, entirely destroyed by the general or normal motion on the south side of the cyclone, but increased on the north side. The effect upon the *inclination* is in this case likewise reversed, being increased on the east or rear side and decreased on the opposite side.

"But since the general motions of the atmosphere form two great systems of cyclone and its corresponding anti-cyclone, all ordinary cyclones are simply cyclones within a cyclone, so that all

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that has been stated with regard to smaller cyclones within ordinary cyclones is applicable here to ordinary cyclones with reference to the general motions of the atmosphere. Hence the isobars of cyclones, as laid down upon the charts, are the resultants generally of two or more systems of cyclones contained within or encroaching upon one another, and to have the isobars belonging to any one system it would be necessary to eliminate the effects of the others. The isobars of all ordinary cyclones are therefore affected generally by the isobars belonging to the general motions of the atmosphere, as well as by the smaller class of cyclones which may be contained within the ordinary ones.

"The progressive motion of a cyclone depends mostly upon the general motions of the atmosphere, but also upon the tendency of the cyclone to press towards the pole. In the trade-wind latitudes the wind at the earth's surface is westward, or at least has a large westerly component, and hence the cyclones in these latitudes are carried westward by this westward motion of the air, especially at certain seasons, and having likewise a tendency toward the pole, the resultant of the two is a westward motion, inclined a little toward the poles, or in the northern hemisphere a motion about W.N.W. After having arrived at the parallel of 30° or 35° in the tropical calm-belt, where there is no westward motion, the progressive motion is a polar one mostly, but after progressing still nearer the pole, into the middle and higher latitudes, the general eastward motion of the atmosphere here, which is great in the upper regions, carries now the cyclone towards the east, and the direction of the progressive motion, which is usually about E.N.E., is the resultant of this eastward motion and the motion towards the pole. All well-developed cyclones, therefore, having their origin near the equator, have mostly a progressive motion represented by a curve somewhat in the form of a parabola, having its vertex in the tropical calm-belt at the parallel of 30° or 35°.

"Both the progressive velocities and directions, however, are very different in individual cases, so that there must be other strong modifying influences, and perhaps among these the principal are the distribution of the aqueous vapour and the positions of the

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general isothermal lines. The equatorial side of a cyclone is generally warmest, and contains the most aqueous vapour. As the air containing this vapour is carried around to the east and ascends, it becomes colder both from its ascent to higher altitudes, and from its being carried into higher latitudes, so that the vapour which it contains is mostly condensed on the east or north-east side of the cyclone. As the power of the cyclone is much increased by the latent heat of the vapour given out by condensation, this gives rise to a tendency to form a new centre of a cyclone continually in advance of the old one, so that the progressive motion of the cyclone is rather a continual forming of new cyclones, at least so far as the lower part of the atmosphere is concerned, in the direction in which the vapour of the cyclone is mostly condensed. Hence the velocity of the progressive motion is generally much greater than that of the general motion of the atmosphere below. The further around the vapour is carried before it is condensed, the more it will incline the direction of the progressive motion from the east toward the pole. If it should not be carried around as far as the east before it is mostly condensed, it inclines the progressive motion from the east toward the equator. If the isotherms should vary much from the parallels of latitude this also might have considerable effect, so that if they extended from S.W. to N.E., the progressive motion would be more inclined toward the poles than they would be if they extended from N.W. to S.E.

"These views with regard to the effect of the unequal distribution of vapour upon the direction of the progressive motions of cyclones were first given by Rev. W. Clement Ley."

The second part of the subject is easily understood, and of the highest importance, corroborated as it is by the observations of Mohn, Hildebrandsson, Loomis, Clement Ley, Meldrum, Willson, Blanford, Toynbee, the Padre Viñes of Habana, and others, whose investigations have been specially directed to the storms and cyclones of the Atlantic, the Southern Indian Ocean, and the Bay of Bengal.

The particular feature to be noted is the undoubted incurvature of the wind—more or less according to the quadrant of the storm

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in which the ship is found, and also according to the latitude. Meldrum, as far back as 1867, first drew attention to the disasters resulting to vessels through the direction of the centres of cyclones being estimated on the circular theory; and in March, 1878, with the wind N.E. at Mauritius, it was found that he had correctly indicated the centre of the cyclone to be to the W.S.W.-ward, whereas on the circular theory it should have been to N.W.-ward. Captain Toynbee, from the discussion of the North Atlantic storm of August, 1873, inferred that the wind in a hurricane draws in towards its centre: the average inclination of all the observations was 29° about the parallel of 50°: the indraft is probably greater in one quarter than in another: the indraft is probably greater near the centre than further from it. Clement Ley's observations for Europe make the mean inclination about 25°; those of Loomis, for America (nearer the equator), about 47°; those of Padre Viñes, for the West Indies, about 45°; and those of Blanford, for the Bay of Bengal, in some cases 42°.

Professor Ferrel, on the same basis, remarks as follows:—

"From the deductions of theory, confirmed now and supplemented by numerous observations, it is evident that many of the usual rules and sailing directions must be very much modified, especially in low latitudes. Although the *horn cards* of Piddington, and all the rules based upon the strictly circular theory of the winds, may still be used at sea in high latitudes without great error, yet nearer the equator they must become more erroneous, and entirely fail at the equator if cyclones could exist there. It is beginning to be pretty generally acknowledged that in sailing directions in a storm, some allowance should be made for a certain small amount of inclining of the winds, but it seems to be thought that this should be the same in all latitudes and at all distances from the centre of the storm. If in low latitudes the inclination of the winds may be 60° or more, the determination of the direction of the dangerous centre of a cyclone from the usual rules based upon the circular theory, in which the inclination is supposed to be naught, would lead to an error of five or six points of the compass. For this reason the amount of inclination at sea under average circumstances should be determined from observa-

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tion for different latitudes, so that the navigator could modify his rules to suit the latitude; but unfortunately we have but few observations yet for this purpose at sea, and very few on land for the lower latitudes. Even on the same latitudes considerable allowance should be made for distance from the centre. While the centre of the cyclone is yet at a considerable distance and the winds have not a great velocity, it should be considered that they are probably, even in high latitudes, considerably inclined toward the centre, and that nearer the equator they may be nearly radial, but even in these latitudes at places near the centre, where the velocities are very great, the gyrations may become nearly circular.

"Where the cyclone has a progressive as well as cyclonic motion, the former makes the inclinations differ on different sides. The progressive motion of the atmosphere at the earth's surface in the United States is very small, only in general two or three miles, and even less in places, and from the S.W. This, however, with Professor Loomis' small average velocities of the wind, should increase the inclination very sensibly in the west quadrant and decrease it in the east quadrant, while the inclinations of the north and south quadrants should be little affected and have about the average value of all. This is the case with his results, and hence they are in accordance with theory. But the progressive motion of the air in the northern part of the Atlantic Ocean, between Europe and America is comparatively great, as shown by the closeness of the isobars, and hence this motion must affect the inclinations in cyclones there very much, especially in such parts of them as have only moderate velocities of the wind, and from this cause the winds should have smaller inclinations in the front than the rear part of the cyclone.

"Mr. Ley obtained greater inclinations in Europe for the front than the rear parts of the storms, while Professor Loomis, for the United States, and Padre Viñes, for the Antilles, obtained the reverse. This, however, may be explained from the consideration that the cyclones in Europe, especially those of the British Isles and Norway, are cyclones within a great cyclone with its centre near Iceland, and this is especially the case during the winter season. They are consequently cyclones upon an inclined plane,

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as it were, and hence the isobars, as usually charted, are very much distorted, and the centre of the cyclone as given by the charted isobars, is thrown to the left or N.W. of the real centre of the cyclone. This decreases the angle with the radius on the front or N.E. side of the storms and increases it on the rear or S.W. side, and consequently the inclination is increased in the former and decreased in the latter.

"The effect of the progressive motion of the air on the inclinations of the winds in the cyclones of the Antilles is quite large, since the progressive motion of the trade-winds is comparatively great. Here the trade-winds become nearly east winds. Hence, the winds whose cyclonic component of motion is from the N. or S. suffer the greatest deviation from this direction, the inclination being decreased in the former case and increased in the latter.

"By a reference to the citations (of the Padre Viñes of Habana) it is seen that in every instance the winds in the anterior part of the cyclone are said to be nearly circular, or to deviate but little from the tangent, while in the posterior part, where the winds are mostly from S.E. to S.W., the inclination is said to be very great, and the winds to blow almost towards the centre.

"It is further stated with regard to these cyclones generally, 'that the winds which have suffered least deviation with respect to the tangent of the circle having for its centre the centre of the vortex of the cyclone, have been those which have blown from the first and fourth quadrants, and those deviating most with an inclination towards the centre, those (which have blown) from the third, and especially the second, quadrant. In the winds from the E. and S. the inclination is such sometimes at all distances from the vortex that the wind blows directly towards it.' Here it is stated again that the winds which blew from the first and fourth quadrants, which are the winds of the W. or N.W. quadrant of the cyclone, and consequently the anterior part of it, had the least deviation from the tangent, and that those winds which blew from the third, and especially those from the second, quadrant, and which are necessarily winds of the posterior part of the cyclones, had the

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greatest inclination, as they should. This inclination seems to have been so great in winds from the S.E. that they blew directly towards the centre.

"The navigator, therefore, on determining the direction of the vortex of a cyclone from the direction of the wind, should, in addition to considering latitude, distance from centre, and velocity, likewise consider in what quadrant of the cyclone he is situated, since the direction of the vortex with reference to that of the wind is so different in different quadrants, especially where there is a large progressive motion, as in the trade-wind regions. In the front part of a cyclone, where the mariner is in the greatest danger, the direction of the vortex is generally more nearly at right angles to the direction in which the wind blows—to the left in the northern hemisphere and the contrary in the southern*—and consequently the old rules of the circular theory are more nearly correct here than on any other side of the storm. We have seen that this is the case in the front part of the cyclones of the Antilles, where the direction of the vortex is nearly at right angles to the direction of the wind, while in the rear it is nearly in the direction in which the winds blows. On either side of the direction of progress, the direction of the vortex in cyclones here may be estimated to be about 45° to the left of the direction in which the wind blows."

In respect to the prognostics of an approaching cyclone, the Professor dwells upon two which should particularly receive attention.

"The almost universal precursor of a distant cyclone is the appearance of more cirrus clouds than usual, not only differing from those of the general currents in form, but also in the direction of the currents indicated by these clouds. The approach of cyclones from the E. or S.E. is always indicated at Havana by the appearance of these clouds when the vortex is yet 500 miles or more distant, and while fair weather is yet prevailing. The

* This is according to Buys Ballot's law, and with reference to the *back to the wind*; the seaman is accustomed to *face the wind*, in which case the statement here made would read—"to the right in the northern hemisphere, and the contrary (or left) in the southern."

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same is also observed as they pass off at a distance. Here the directions of the currents as indicated by the cirrus clouds seem to be very nearly radial, as they should be by theory in these low latitudes, and at great distances from the centre, and hence the direction from which they come indicates very nearly the direction of the vortex of the cyclone. In these low latitudes the progressive motion of the atmosphere above is small in the cyclone season and does not interfere much with the directions given by regular cyclonic motions." * * *

"With regard to the existence of an anti-cyclone in connection with every cyclone and the broad annulus of high barometer with its maximum at the dividing limit between the cyclone and anti-cyclone there are many confirmatory observations, but this maximum may be interfered with and masked by numerous irregularities. On the ocean where the cyclonic systems are more regular, if we had a sufficient number of accurate observations, the annulus of high barometer and the winds of the anti-cyclone could be more readily distinguished from the other irregularities, especially within the tropics, where these irregularities are smaller. In the Antilles, where the islands, being small in comparison with the expanse of ocean around them, the annulus of high barometer is readily observed, and the approach of the cyclonic centre indicated several days in advance of its arrival by the rising of the barometer above its normal level." The hurricane of September, 1875, was thus indicated at Havana while the cyclone was yet 1,200 miles distant, and that of September, 1876, was similarly shown by a rise at Havana, while it was causing great destruction at Porto Rico.

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THE PRESENT CONDITION OF BRITISH SHIPS.

IT is now some sixteen years ago since the dignified quiescence of the London shipping world was somewhat rudely disturbed by the foundering of a first-class steam-packet ship, which, with tragic horrors, and a full complement of trustful passengers, had gone down into the solemn depths of the Bay of Biscay, without any, apparently, very clear, just cause.

Those luckless voyagers so opulent of faith in the staunchness of their ship, were soon to have their minds terribly disabused; for, after being a few days at sea, and then in an ordinary gale such as hundreds or even thousands of old and ordinary ships had successfully weathered, they were brought face to face with the awful fact that their "magnificent" and nearly brand-new steamer had *somewhere* sprung a leak, and was going to the bottom of that rolling sea.

The case of this ship is brought into review here, as being one of much importance at the present time; inasmuch, that she was probably about the first of a series of such losses, which, for the last few years, have been very common, viz., the deliberate and certain swamping on the first whiff of bad weather, of so-called *A*1 100, *first-class iron steamers*, too feeble apparently, independent of such high class, to withstand the ordinary shock of battle.

There was a cry at the time that this ship was too deep, and that she was also crowded with coals and stores, but this mainly, as time has since proved, was a cry without foundation. The ship was *not* overloaded; she was deep, but not improperly so,—many honestly-loaded ships at the present day load much deeper than she was. What led to her loss, if it did not first bring on the trouble, was rather a builder's defect in the construction and plan of her deck arrangements; otherwise, she was as good, and withal as fairly loaded a ship as ever builder launched, or seaman navigated. Why this not inconspicuous defect, a low engine-room skylight coaming with a fragile (and foolish) glass top, was not marked as a *weak place* by the surveyors of that day, can be better

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understood than that of the builder's or designer's deliberate construction and plan of it, considering the tremendous power of ocean waves when breaking on the decks of a loaded ship.

About this time the moderately long and narrow ocean steamers were beginning to appear in our docks and ports. They were, however, very doubtfully received by all those who did not regard a ship as simply a machine for earning freight, or who had a care for a good and safe reputation, obtained through many years of honourable trading. "Eminent authorities," in their wisdom, had declared such vessels to be unsafe; they were quite too much a leap in the dark for their understanding. Sir William Fairbairn, the joint constructor of the celebrated iron tubular bridge, himself considered no mean authority in such matters, had also expressed an unfavourable opinion of such ships, in the course of which were let fall some curious hints about breaking in two, &c. Also, an "eminent scientist," or professor of something, had, with much positive speech, easy flow of oratory and choice flowers of rhetoric, &c., uttered the following ominous words in a kind of informal manifesto, which has been prophetic enough in a certain way, but not as he intended it should be in respect to long and "narrow" "floating palaces." Said he: "I have no hesitation in thinking and declaring that Cook in his frail brig, or even Columbus in his caravel, was more safe in a sea-way than are we of the present day in our palaces afloat, and it is my firm conviction that the more we depart from the proportions of the lifeboat so much more unseaworthy do our ships become." It thus appears that the stress of danger was, by all such eminent authorities, placed on extreme proportions as excessive length, and not at all, or hardly at all, on what has by the unfailing light of experience, proved to be the weak and dangerous condition, viz., a low freeboard, combined with badly planned and feebly constructed deck fittings and hatchways, or other imperfectly fortified entrances to engine-room, &c., conditions apparently not yet understood as they should be by great numbers of builders or designers.

As to the alleged dangers threatened for long and narrow ships, it is indeed curious and instructive to again note how often in the

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world's history "eminent authorities," with much profession and reputation of wisdom, have been but devious and blind leaders. In the face of all those dismal warnings against distinction of proportions and its attendant dangers from the "world's masters," the enterprise and energy of the country, with sharper eye and clearer head, has quietly but restlessly advanced from 7 to 11 breadths in length, and has found such ships the most comfortable and the safest in an exceptionally stormy sea; and with the discovery, moreover, that there is a lesser danger in excessive length *in the hands of an able builder*, than in low freeboards, rotten frames, scamped work, badly planned hatchways and skylights, or the hidden mysterious and dark ways of marine insurance.

Vain will have been the efforts, futile their resolutions, and wasted the time of the Royal Commissioners on freeboard, if all the above, and some other important considerations, have not entered largely into their calculations. A storm wave which runs twenty feet above mean level, and strikes with a force of three tons to the square foot, is but a little respecter of inches. It is all the same to that rushing mountain whether the freeboard be three or four feet, get on board it must, in greater or less amount, and with tremendous power where it strikes.

An example of this, out of very many, happened but a few months ago to H.M.S. *Warrior*, which, in a channel storm, according to report, had her decks overrun with heavy seas, notwithstanding her high and bold side. She is a long ship, upon which the crest of one wave alone makes but small impression. Long ships should have bold sides, and must have stout decks!

In the opulent and halcyon days of navigation, before the iron horse was "foaled," or the ship in all her majesty of swelling canvas, had resolved herself into a pitiful "ocean tramp;" when the produce of the world was carried over sea within walls of British or other oak, no such troubles and annoyances as the obnoxious load-line, beset the easy going and honourable shipowner. His ship was not only always in good trim, but was a comparatively short and consequently strong fabric, and rode over the waves like a sea-gull.

Thus, heavy and dangerous seas but seldom fell on board, and

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the decks and their fittings were not constructed with a view to resist anything much heavier than sprays. When such ships were "hove-to" during a gale of wind it was considered by the crew fine shelter to sit under the weather bulwarks and carry on the lighter part of the daily routine work.

The ships and steamers of the great companies of the present day are, many of them, perfect models of symmetry and a certain kind of beauty; they are all, or nearly all, as specimens of architecture and strength, perfect. These companies take their own risks in the insurance of their fleets. Although costly and good ships, there is perhaps one doubtful point about them—perhaps more than one—but certainly one, and that is their so-called watertight bulkheads. Are they watertight, that is to say, seaworthy? Have they always proved themselves to be such in accidents recorded? The modern ships, those built during the last five years, may be more perfect in this respect, but it must never be forgotten that a bulkhead, when it does come into use, has to float probably—a loaded ship—with enormous pressure.

From the construction of many bulkheads it would appear to be doubtful whether they are capable of doing what is claimed for them. As a rule they consist of a series of somewhat light iron plates extending across the whole breadth of the ship and the full depth of the (lower hold) in many cases, say 16 by 50 feet; and this immense area, supported simply by rather light vertical angle irons, about four feet apart. There appears in many ships, in nearly all, to be nothing about this great breakwater to stop it from giving way amidships in a vertical line between any two angle irons, except the connexion at top and bottom, two points perhaps 15 feet apart.

In any ship having more than thirty feet beam, perhaps more than five and twenty, a bulkhead to do effective service in case of a collision should have a stout central support, springing vertically from the keelson and attached above to the deck. To be as strong as a keelson with, say, vertical angles on the after side as at present, and in addition transverse angles on the opposite or fore side at a point, particularly, half way between the deck and keelson.

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As to some of the wretched creations of ignorance and greed which are now known as *first-class ships*, and which so ostentatiously carry about the British flag on their unhandsome and unworthy shoulders, there are those who do not require good ships so much as anything having the semblance of one, sufficient to pass a "first-class" survey, which will enable them to command a freight and get to sea with it. If the laws of marine insurance were revised perhaps matters might improve. If, for example, ships could only be fully insured against such risks as loss by stranding, by collision, &c., and for not more than two-thirds their value in "*missing*" cases, or if the remaining third was taken as a fine and paid as compensation to the bereaved families in such cases as non-compliance with demands in building, &c., it might have an improving effect, and cause people to take *half* as much care for their ships as they take for their horses and carriages.

It is only a few years since that a first-class "magnificent" steamer left England for an Indian port, with nearly a hundred passengers in her spacious and heavily gilded saloon. Before she had got to Port Said she fell in with a moderate gale of wind which all but wrecked her. It swept out the flimsy fittings of the gilded saloon, knocked in the doors and windows, stove in main-hatch, carried away a trumpery *wooden* bulkhead (painted to imitate iron) round the stoke-hole and engine-room, and, finding its way below, put out the fires. The water actually spurted in through the butts of plating under the engine-room in huge volumes, and but for the gale being moderate and taking off suddenly, she would probably have gone down. She afterwards did founder with all hands under unknown, but probably similar, circumstances.

Another large new steamer, much stronger and more honestly built than the above, came near foundering in the Atlantic by having her "fidley" doors knocked in. She had a strong iron house built round by her engine-room and stoke-hole, but the "fidley" doors were made of wood, and the ship being deep those doors simply gave way to pressure of water, they were not *struck* by any wave at all. She was saved on that occasion partly by her sails blowing away, and partly by the heroic energy of her officers, but has since foundered and left nobody to tell the tale.

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Other innumerable cases might be mentioned here of narrow escapes of the much shorter and more honestly built wooden sailing ships—many of them the finest specimens of their kind—by having main hatches knocked in, decks swept, and saloons cleared out by the whole or part of the front of poop giving way, the result of an inaccurate conception, to put it mildly, on the part of their builders or designers, of the enormous power of water either agitated as storm waves or at rest after getting on board.

As to the height of waves in a storm many experiments have been made, but it may be doubted when the heaviest seas have yet been accurately measured.

A winter or two past, one of the great Atlantic steamers running before a heavy gale—dead before it, irrespective of course—entirely flooded the engine-room, and nearly put out her fires. The seas—one or two crests—rolled completely over her. Coming in aft, they took away most of her boats and swept her decks from end to end, though doing but little damage there. Perhaps some twenty or twenty-five tons of water went below, and over engine-room hatchways, or stoke-hole guards, where coamings by careful measurements were known to be twenty-four feet above the load-line.

It requires but little speculation to determine what would have happened in such a case, if this ship's main hatch had been but six or ten feet above mean level, and formed of the flimsy material which is commonly employed—the relics of a high freeboard or short ship age.

Experience has proved that in all ships there are innumerable weak places which only experience and shrewd seamen can know of; and this was demonstrated in a very forcible way, during the last few winters, in one or two of the so-called "greyhounds of the oceans."

There is no royal road to this kind of learning! A man must actually see war and take part in it before he can either make it or cope with it effectually.

One ray of light is at last breaking through the dismal and cloudy horizon in the shape of steel ships, about which it is said

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"you cannot get them down;" it is doubtful, however, if the Manchester school, with its hydraulic presses, &c., will not soon find a way.

Respecting the obnoxious but important question of freeboard the writer would be sorry to arrogate to himself any superior knowledge on the difficult subject, though it does not, in his humble judgment, appear to be so "insurmountable" as many make it out. Is there not another way of getting at the difficulty than by affixing a legal hard-and-fast line on the ship's side? It is well to leave trade free as air of all, even well-intentioned, laws which may possibly repress it; but when that trade works in channels which are dishonest—even "murderous," as has been said—at any rate, unjust and highly dangerous to life and property, there is a duty which the State owes to its people, the innocent sufferers, which must compel it to interpose its authority, just as firmly as it does against the furious driving of cabs in crowded streets, or even that less guilty practice of working young children or adult women in mines or in factories.

When England fights for her life, that great battle must be fought on the sea by "strong-headed, sure-footed, sea-stomached, hard-fisted seamen," it behoves her, then, to have a care for the nursery of such valuable material.

There was a time when the flower of her superfluous youth took as readily to the sea as young ducks take to water, but that time has gone by with the love of their hearts, the *poem*, made up of wooden sides, copper bottom, bright, shining, tall, tapering spars, maze of cordage, and trim canvas. The low, black, snake-like rusty monsters of ugliness now, from the fact of their going to "foreign lands," yet attract some, and that few should be looked after.

Our fathers laid down the principle that a good and fairly loaded ship, ably commanded, will live in any sea, and this belief is as justifiable now as it was then. So that you keep the water out she absolutely cannot sink, she must float, as certainly as a well-built church will stand on its foundations.

Thus some legal control of insurance arrangements, as already suggested, could hardly be looked upon by the honest trader as a

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grievance, or by the country as repressive to fair trade. Other trade abuses not half so heinous as this are controlled by saving laws, and why not this, and in the least objectionable and most effectual way? If the disorders cannot be got at in one way, then they must be attacked in another.

By control in insurance in all "missing" cases where owners, for example, have not complied with certain demands in building, &c., &c., shipowners would be left very much the masters of their own affairs, much more so than they are by existing statutes, respecting the objectionable and difficult marks on side.

As to the limit of safety in loading, that is a matter which depends very much upon the strength of the ship and the construction and finish of her decks and hatchways, or other openings thereon.

A strongly built ship, with a covering of boiler plating fore-and-aft, would, as everybody knows, float with half an inch of free-board; it is all a question of keeping the water out. As at present constructed, our steamers and sailers, good and bad, in the matter of load-line, probably reached the limit of safety long ago.

E. B.

CHARTS OF METEOROLOGICAL DATA FOR THE OCEAN DISTRICT ADJACENT TO THE CAPE OF GOOD HOPE.

Between Lat. 30° and 50° S., and Long. 10° and 40° E.

(*Abstract of the Explanatory Remarks.*)

THIS district was chosen for discussion by the Meteorological Office in 1875, partly on account of the abundance of observations existing, and partly on account of its importance to navigators.

The results of the investigation are now published in a volume of charts, and the accompanying explanatory remarks give (I.) an enumeration of the principal works or memoirs which have already appeared relating to the district; (II.) an account of the observations upon which the present work is founded; (III.) an explanation

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of the mode in which the observations have been treated; (IV.) a description of the charts themselves; and (V.) a statement of some of the chief results relating to the physical characteristics of the district which are suggested by an examination of the charts.

I.

Among the works relating to the district are noticed: Major Rennell's Investigation of the Currents. Maury's Wind and Current Charts. Horsburgh's Indian Directory. Various works by the Hydrographic Department of the Admiralty and of the Meteorological Office, also numerous publications of the Royal Meteorological Institute of the Netherlands.

II.—Observations on Which the Charts are Founded.

The number of sets of observations employed in the preparation of the charts is about 147,000, giving an average of 12,250 for each of the 12 months. They are, however, unequally distributed among the different months, ranging from about 8,200 in April, to 15,000 in August. The observations extend over a period of 24 years, from 1855 to 1878 inclusively. They are for the most part four-hourly; so that the 147,000 (complete or incomplete) sets are equivalent to those of 24,500 days. Of the 147,000 sets of observations, 94,000 are taken from meteorological logs preserved in the office, and furnished chiefly by merchant ships, but partly also by ships of the Royal Navy; 10,000 are from the logs and remark books of Her Majesty's ships preserved at the Admiralty; 40,000 are from the logs of Dutch ships, communicated to the office by the Royal Meteorological Institute of Holland, and 3,000 are from miscellaneous sources. In addition to the complete sets of observations the logs preserved at the Admiralty have yielded about 1,400 observations of currents.

III.—Mode of Treating the Observations.

Weighted Observations.—In the Cape District the tracks of outward and of homeward-bound ships are different; if, therefore, every observation were made use of in the preparation of the charts, the winds that were in either case opposed to the ship's

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course would be too frequently recorded. Head winds would delay the ship, and there would in consequence be too many observations of them. Conversely, the frequency of favourable winds would be underrated. In order to ascertain whether the inequality thus arising is of any practical importance, an examination was made of the winds in certain parts of the district which are frequented by both homeward and outward-bound ships; and a comparison was instituted between the relative prevalence of a given wind as derived from the logs of ships passing in the two opposite directions. The results were found to differ to a considerable extent; and it became necessary to adopt some mode of adjustment. As a ready, though only approximate method, the plan was adopted of admitting no more than a single observation from the same ship on the same day and in the same one-degree square; the mean being taken when the ship had made many observations on the same day in the same one-degree square. The observations, as has been already stated, are made at four-hourly intervals; and it is only with unfavourable or adverse winds that a ship would record more than two or three observations in a single-degree square.

Frequency of Gales.—The percentage of recorded winds whose force exceeded 7 of Beaufort's scale (a moderate gale) has been tabulated for the various parts of the district in the several months, and the results are shown on the index charts by degrees of shading which indicate the greater or less tendency to stormy weather independently of the direction in which the wind may blow.

Details are given with respect to the mode of treating the various elements.

IV.—Description of the Charts.

The series of Charts consists of—

A. Twenty-four large monthly charts, in twelve pairs, one pair for each month. These contain the original observations in as much detail as is practicable. They also contain generalized results. Each pair of charts lies face to face in the volume; the chart to the left, when the book is opened, refers to wind, air-

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temperature, and barometric pressure; the chart to the right refers to ocean currents and sea surface temperature.

B. Two index charts for the whole year, face to face, to match with the above-mentioned set. They are divided into compartments, each of which contains on a small scale the generalized results only.

C. Quarterly charts of the specific gravity of sea water, of the distribution of floating ice, and of the times taken by outward-bound ships to traverse the district.

V.—Chief Results.

Winds.—A chart of mean results affords little information about the actual stream lines of the aerial currents, such as are pourtrayed in synoptic charts. It can show no more than the relative frequency of the various surface winds at different localities, leaving it to be inferred from other data how far its indications of air currents represent actual movements of the air in those directions, as in the case of the Trade Winds, or how far they represent a line along which different systems concur in having the same direction, as in the case of the prevailing south-westerly winds of the English Channel, which are for the most part the southern limbs of successive cyclonic systems, whose centres cross the meridians of the Channel, to the northward of it.

The sequence of weather experienced by the same ship, the comparison of simultaneous observations made by ships and at certain land stations in the Cape Colony, and the Synoptic Charts of the Indian Ocean for the month of February 1861, published by Mr. Meldrum, concur in showing that the weather off the Cape of Good Hope is dependent on cyclonic and anti-cyclonic movements, precisely as it is in Europe, over the Atlantic, and in the United States: and also, that the rate of progress of the cyclonic systems is usually from 20 to 30 miles per hour. It must of course be borne in mind that the directions of cyclonic and anti-cyclonic rotation which are respectively left-handed and right-handed in the Northern Hemisphere are reversed in the Southern.

The conditions under which atmospheric disturbances are produced exist in singular force in the district dealt with. It is shown in the section relating to Ocean Currents and Sea-Surface

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Temperature that large volumes of hot and cold water intermingle to the south of the Cape, causing a wide range of sea temperature in adjacent localities, and that the sea-surface isotherms are in some places crowded more closely together than perhaps in any other part of the globe, except between the Gulf Stream and the Labrador or Arctic Sea Currents, and the Japan Stream and its counter cold current. In addition to this, a notable disturbance is produced by the excessive heating and cooling, by day and by night, in summer and in winter, of the arid and high table-land of South Africa, whose mountainous rampart, especially on its eastern side, probably concurs with the heat of the interior in the one case and with its cold in the other in impressing a cyclonic or anti-cyclonic character, as the case may be, on the motion of the air round the southern coasts of the African continent.

There are yet two other permanent conditions that are closely related to the prevalent winds in this district. Areas of high pressure, of which the limits do not extend as far as the coast of Africa, exist on either side of it, where the Anti-Trades of the Atlantic and Indian Oceans respectively descend, and from which the corresponding Trade winds flow. These areas move with the sun, travelling to the northward in winter and to the southward in summer. Between each of them and the southern coast of Africa, the winds have an anti-cyclonic drift which is very apparent in the charts.

The prevalent wind-systems appear to be six in number.

No. 1. A West wind that prevails over the whole of the lower half of the district and part of the upper. The barometric conditions with which it is associated are those of diminishing mean pressure as we proceed southward, accompanied by a great increase of variability in the pressure. The first condition taken by itself might be construed as indicating nothing more than the existence of a large permanent Antarctic depression, along the northern edge of which a broad belt of air travels permanently from the west in a great cyclonic curve; but the second condition suggests an additional interpretation. It shows that the mean low pressure is in part due to the pressure being sometimes low and sometimes high, but frequently very low: that is to say, it testifies to the

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existence of an area across which barometric depressions travel along paths lying more commonly in the southern than in the northern part of the area comprised in the chart, or, it may be, altogether beyond its southern limit, the prevalent westerly winds being the northern limits of these successive cyclonic systems. In the high latitudes reached by Sir. J. Ross in the Antarctic voyage of H.M. ships *Erebus* and *Terror*, 1839-43, the prevalence of westerly winds had ceased, whence it may be inferred that the usual paths of the cyclonic centres lay to the north of him. There are no data from which it would be possible to construct even approximately a diagram showing the relative frequency with which different points in the same meridian are crossed by the storm centres.

No. 2. The south-east Trade wind of the Atlantic. It is plainly seen at the upper left-hand corner of the summer charts, and indications of its commencement may be traced in all of them.

No. 3. A contingent to the Atlantic Trade winds from the western part of the district. It enters the chart at the lower part of its left-hand margin and sweeps anti-cyclonically round the edge of the area of high pressure above-mentioned, at the place where the Atlantic anti-Trades descend. It becomes a south-east wind just before its confluence with the south-east Trades of the Atlantic Ocean.

No. 4. Another contingent to the south-east Trades of the Atlantic, which has arrived from the east coast of Africa in a cyclonic curve round the Cape. This is probably a southern portion of the south-east Trades of the Indian Ocean, diverted into a north-easterly wind, when it enters the chart, by its proximity to the land of Africa and to the western edge of the area of high pressure in the eastern part of district. In the summer months it is strong, and is the prevalent wind round the coast of Africa, when the cyclonic conditions of a heated land-surface are present; in winter, when the surface of South Africa is chilled, it is weak, and only occasionally displaces No. 5, which is then the prevalent wind. In the north-eastern corner of the district it exists throughout the whole year; and is here more easterly in summer when the area of high pressure in the eastern

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part of district lies well to the southward, and more northerly in winter when that area has travelled northward.

No. 5. An air current in exactly the opposite direction to No. 4, and its converse in strength, being weak in summer, and strong in winter when the area of high pressure in the western part of district has moved to the northward, and when the anti-cyclonic condition of a chilled land-surface in South Africa is also present.

No. 6. A northerly air current over the eastern part of the district. In the summer it is anti-cyclonic round the edge of the area of high pressure at the place where the anti-Trade Winds of the Indian Ocean descend. In the spring and autumn its course is straight, and in winter its curvature is slightly cyclonic towards a centre in the west, which probably then lies over the place of intermingling of the hot and cold ocean-currents.

In the neighbourhood of the centre of the chart [lat. 37° S., long. 25° E.] the different wind-systems are in close proximity. The consequence is a confusion of winds in that area amidst which no one of them is prevalent.

Variation of the Winds in different Seasons.—In summer the confluence of Nos. 3 and 4 is clearly seen. No. 4 is strongly marked, being cyclonic round the heated land of South Africa. The areas of high pressure at the descent of the anti-Trades move to and fro with the sun, and are now at their southern limit, lying within the latitudes of the chart, and the place of the confluence of Nos. 3 and 4 with the Trades of the Atlantic falling well within it. The belt of westerly winds, No. 1, is displaced to the south; it barely reaches latitude 40° S. No. 6 is faintly marked, and anti-cyclonically disposed to the area of high pressure towards the east. *In winter* No. 3 disappears, No. 4 is secondary, and No. 5 becomes the prevalent wind. The place where the Atlantic trades are first felt is now to the north of the chart, and the northern edge of the belt of westerly winds, No. 1, has also travelled so far northwards as to become confused with No. 5. No. 6 is well marked, but is now cyclonically disposed towards a centre lying westwards.

Gales.—Gales are most frequent in July; least frequent in

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February. The areas of their greatest frequency approximate roughly, at least in the winter months, to those of wide range in sea surface temperature.

Currents.—The ocean currents in the district to which the charts refer may be resolved into two primary and three secondary ones.

The primary currents are :—

No. 1. The narrow "Agulhas current," running strongly to the south-west off the south-eastern coast of South Africa and along the edge of the well-known Agulhas Bank, which stretches to the south of the cape that bears the same name. It is warmer by some 8° than the neighbouring water in the same latitude, its temperature being in February as high as 70° in the 39th parallel of latitude.

No. 2. A current running north-eastwards, and covering the whole of the southern portion of the Chart. In S. lat. 46° to 50° its temperature is as low as 40° throughout the year, being nearly 10° lower than the surface temperature of the sea in the same latitudes in the Pacific Ocean.

These two currents travelling, the one to the south-west and the other to the north-east, come into direct opposition in and about S. lat. 40°, and especially in the neighbourhood of E. long. 20°. There they check, and intermingle with, one another ; facts which are respectively shown by the crowded isotherms, and by the wide range, of sea surface temperature.

From the region in which the two primary currents meet, the secondary currents (3) and (4) proceed.

No. 3 is a cool current running north-westwards along the western coast of South Africa.

No. 4 is a warm current running eastwards a little to the north of S. lat. 40°, and to the east of E. long. 20°.

No 5 is a back drift of the Agulhas current, running north and north-eastwards between it and the coast.

Variations of the Ocean Currents in different Seasons.—No. 1. The portion of the main stream of the Agulhas current that is included within the district under discussion has a mean speed of 51 miles in 24 hours in the hot month of February, and of 46 miles in 24 hours in the cold month of July ; the maximum speed

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recorded in each of the two months being 108 miles. These results are derived from 89 and 100 observations respectively.

No. 2. The current running to the north-eastward is more northerly in direction and stronger in summer (December, January, and February), than in winter (June, July, and August). This is well shown by comparing the index charts of currents for January and July.

No. 3. This current is stronger in summer, when the S.E. Trades are at their southern limit, than in the winter, when north-westerly winds are common in the north-western corner of the district.

No. 4. This current extends less far to the north and is less northerly in direction in winter than in summer, probably owing to the westerly winds, which extend further north in winter than in summer.

No. 5. No seasonal differences have been discovered, but they may have escaped observation owing to the special difficulties already referred to as affecting the estimation of this current.

Ice.—The observations of ice recorded in the charts are extracted from the English and Dutch logs that were discussed for the general purposes of the inquiry. They are far less numerous than those upon which the Admiralty ice chart of the Southern Hemisphere has been constructed. The charts are, however, of corroborative value, as giving the results of some additional evidence. They agree with the Admiralty ice chart in showing that during the spring, summer, and autumn months the danger to ships of meeting ice is greatly increased when they make their passages south of the forty-fifth parallel. It is the more important to call attention to this fact as emigrant ships not unfrequently make their passages in high southern latitudes during the seasons in which floating ice abounds. In the winter the risk from ice is much smaller, but at that season the winds to the south of the forty-fifth parallel are less favourable for sailing to the eastward, and the weather is more severe.

The Admiralty ice chart shows that in certain years ice has been met with near to the land of South Africa; so that a look-out for ice should be kept at all times when passing round the Cape.

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Passage Diagrams.—These have been compiled to enable us to learn the relative rate of sailing in different parts of the district now under discussion, by comparing the breadth of the district at *different* parallels with the mean number of days occupied by ships crossing it on or near those parallels. It has been thought sufficient for this purpose to classify the passages according to the latitude in which the 20th East meridian was crossed. The result is shown in the last column of the accompanying Table, whence it appears that the rate of sailing is fastest along the forty-third parallel, and much faster there than anywhere to the north of it; also that the rate is little less in any of the more southern latitudes within the limits of the chart. It should, however, be stated that some of the passages in latitudes south of the forty-third parallel were made by Australian "clippers" noted for their speed.

Number of Ships.	Latitudes between which the 20th East Meridian was crossed.	Breadth of District at Middle Latitude. Miles.	Average Number of Days occupied in passing between East Longitudes 10° & 40°.	Average Easting made per Day, in Nautical Miles.
54	36°—38°	1438	10·1	142
220	38°—40°	1399	8·8	159
147	40°—42°	1359	8·3	164
116	42°—44°	1316	7·3	180
38	44°—46°	1273	7·3	174
15	46°—48°	1228	6·9	178
4	48°—50°	1181	6·8	174

No similar attempt has been made to classify the passages of homeward-bound vessels, as they follow the same routes in all seasons. Their object is to keep near to the land, where they have the benefit of the Agulhas current and a greater probability of easterly winds than if they kept further off. The average duration of the homeward passage in the different months of the years between the East meridans of 40° and 10° differs greatly; it is given in line A :—

Number of Days.	Jan.	Feb.	Mar.	Apr.	May.	June	July.	Aug.	Sep.	Oct.	Nov.	Dec.
A. By observation	14	13	14	16	21	22	20	17	16	14	14	14
B. By estimate -	14	14	16	17	19	21	21	20	18	17	15	16

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By means of the wind-roses an estimate was made of the probable relative duration of the homeward passages in different months; the results are given in line B. The general agreement of the two sets of figures tends to show, on the one hand, that the averages given in line A are not materially affected by accidental differences in the sailing powers of the observing ships; and on the other hand, that wind-roses may be employed to estimate, with a certain amount of accuracy, the probable relative duration of passages.

Weather Characteristics of certain Regions in the District.—There are four natural areas in the district that have well-marked peculiarities of weather:—

1. The Agulhas current and its neighbourhood, where lightning and mist are abundant.

2. The region of intermingling of hot and cold water in the neighbourhood of 40° S. lat., where "squalls," as well as gales, are most frequently recorded.

3. The north-eastern corner of the district, where the warm wind from the Indian Ocean meets the cold winds of more southern latitudes. Here more lightning has been observed than in any other part of the district, and the gales, though less frequent than in some other parts, are exceptionally liable to sudden shifts of direction, and are therefore dangerous.

4. The western side of the district, to which the warm Agulhas current does not penetrate and which is consequently less liable to disturbed weather. Settled weather is especially found in its northern part, where the drift caused by the S.E. Trade of the Atlantic commences. Here the sea is exceptionally cool, because the surface water carried northward by the drift is apparently replaced by cooler water rising from below as well as from the south.

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PORT VICTORIA, RIVER THAMES.

A NEW port which is expected to be largely used for Continental and Transatlantic traffic, alike for passengers and for merchandise, has been opened on the banks of the Medway, at a point nearly opposite to Queenborough, in the deep-water channel of the river. The port has been named Port Victoria and the advantages claimed for it are that it shall at once give facilities for loading and unloading the largest sea-going vessels, in any state of the tide, at a point within 50 minutes by rail of London, and without any of the delays which necessarily result from navigating the tortuous and crowded waterway of the Thames between Gravesend and the docks; with the additional prospect, when the new pier is built, of having the means of accommodating, for loading and unloading purposes, vessels in 27 ft. of water at low water in ordinary spring tides. The pier, which has already been completed, is 450 ft. in length by 50 ft. wide, and has, close in, a depth of 22 ft. at low water. The main pier, which will be commenced immediately, will be built in the stream about 100 yards distant from the present structure, and will have a length of 600 ft. and a width of 60 ft. The trains will run directly on to the pier over lines laid on cylinders and latticed girders, and will discharge passengers and cargo directly into the vessels moored alongside. The company have secured some 500 acres of ground in the neighbourhood of the port, on which it is intended to construct docks capable of accommodating the largest ships afloat, and which will be further utilized in such other ways as may be necessary for the success of the undertaking.

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THE SEYCHELLES ISLANDS.

THE following letter recently addressed to the *Times* by C. S. Salmon, Esq., late Chief Civil Commissioner of the Seychelles, refers to the advantageous position and excellent climate of that group of islands in the Southern Indian Ocean; its general tenor appears to be of such importance, and probably of such general interest to some of our readers, that we believe we properly transfer it to the pages of the *Nautical*.

"In a letter to the *Times* on the subject of French commercial relations with Madagascar, it is stated that the French, besides Réunion, have the islands of Mayotta, Nossi Bé, and the St. Mary Islands off the coast of Madagascar, whereas Mauritius is the 'only' British colony in those seas.

"I think the moment opportune to let it be generally known through the columns of the *Times* that England possesses in the Indian Ocean a colony superior to any of these French settlements in every respect, and, for commercial facilities, not inferior to Mauritius itself.

"The Seychelles Islands are British possessions and are the nearest habitable land to Zanzibar, East Africa and Northern Madagascar. They lie nearly midway between Aden and Mauritius (and Réunion), and are in the direct track of vessels proceeding from East Africa to India, Ceylon, Java, and the Straits Settlements. Were nature called upon to create a position in these seas suitable for mercantile purposes hardly a better position could have been selected than these islands, and they are destined to be in the future of immense commercial value.

"The Seychelles Islands have been little heard of; they were first colonized by the French in the 17th century; they were made dependencies of Mauritius after their cession to England in 1814. The Mauritians, having a good harbour of their own and being absorbed in the pursuit of their own welfare, cared little about them, and they did not prosper under their rule; they even fell away considerably from the position they held under the French.

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Various circumstances—such as the opening of the Suez Canal and the growing importance of Eastern Africa and Madagascar—have recently brought them into notice.

"I have had the advantage of conversing in the harbour of Port Victoria, Mahé Island (the chief island of the group), with many of Her Majesty's naval officers, and also officers commanding French and German war vessels and captains of mail steamers, and all these authorities, without exception, spoke highly of the islands and their valuable harbours. Of the harbour of Port Victoria, De Froberville says:—'Il serait facile le fortifier de manière à ne rien craindre.' A German officer told me 'it could be easily made as impregnable as Malta, but more easy to hold and more difficult to take; the town and port would be unattackable by land, and could be made the same by sea.' It is never likely to be utilised in this way by England, but it will do no harm to have its capacities known. The harbour is four miles deep and 8½ miles wide, and is enclosed and sheltered by five hilly and rocky islands, partially wooded and planted with cocoanuts—landing being impracticable on all these islands except from within the harbour. The entry to this harbour is by deep channels, well marked by buoys. There is an inner and outer anchorage. The latter has 10 to 12 fathoms of water, with stiff holding-ground, and there is room for 800 ordinary craft. In the inner harbour large and secure docks could be sawed out of the coral formation with slight cost. In the last few years those distinguished administrators Sir Arthur Gordon and Sir Arthur Phayre resided much at Seychelles, and by their advice these islands were permitted by the Queen's Government to regulate the expenditure of their own taxes (about £15,000 to £16,000 a year) without reference to the Mauritius Council. Many improvements have been made in consequence—wharves have been built where vessels may lie alongside to coal; harbour lights have been erected; and a perpetual supply of good water has been brought to the end of a large jetty, and is free to all vessels.

"The island of Mahé is about 19 miles long by six miles wide, but of irregular shape. It has 10,000 inhabitants. It has a cathedral, and chapels, and schools. Its beauty and verdure may be

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judged of from its having a clear running stream of water for every day in the year. There are many cascades, and when a vessel of war is in the harbour, officers and men may be seen bathing in the cool and limpid pools formed among the umbrage-covered rocks, and excursion parties are met with on their way to scale the 'Trois Frères,' 'Morne des Seychelles,' and other mountains, nearly 3,000 feet high. The most magnificent palms in the world, strange *pandanæ*, tree ferns 40 ft. high, the pitcher plant, and many other such like, charm the botanist. An elastic and pure breeze tempers the heat for most of the year. Hurricanes—those dangers of Mauritius and Réunion—never visit these islands, *nor* do any of the fevers and sicknesses common to these places, and which are incidental to most tropical countries. In fact, this *is* the only station in these seas where Her Majesty's naval officers can allow men to go ashore with absolute impunity; and, consequently, every vessel in the East India squadron is specially permitted to remain ten days in every year, but the Admiral sometimes remains five or six weeks.

"Were space available, I could say more of these islands, their considerable resources and fertility, mostly undeveloped; the beautiful harbour at Praslin Island, suitable for the largest iron-clads, and other fine anchorages; the wonders of the Coco de Mer ravine and forests (relics of a former world). Then there is that strange thing in nature—also a British possession—the Aldebra Islands, near North Madagascar, and its extraordinary lagoon, where the giant land tortoise (weighing froom 500 lb. to 1,000 lb.) rules in almost impenetratable jungles.

"The people of Seychelles are loyal and hopeful, and think much of their beautiful homes. The possessions of England are great, but there are few more interesting than these islands. They are among the smallest jewels in the Crown, but they are of the finest and purest water. What would France not give for them, who is wasting millions of francs on a futile attempt to make a port at Réunion, and who endeavours in vain to attract trade to fever-stricken Nossi Bé and Mayotta?"

[Our readers may possibly not be aware that there are excellent charts of, and full sailing directions for, the Seychelles and their

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vicinity; the latter are contained in Findlay's "Indian Ocean Directory," Imray's "Indian Ocean Pilot," and Commander A. D. Taylor's "Indian Directory," Part I. At Port Victoria in Mahé there is a good *fixed red* light, visible from a distance of 9 miles; and the harbour and channels leading thereto are well marked by beacons and buoys, so that vessels can enter during the day without the assistance of a pilot. A *fixed white* light, visible about 15 miles, has also recently been established on Dennis Island, the northern island of the group.—Ed. *N. M.*]

MERCHANT SHIPPING (EXPENSES) ACT, 1882.

MEMORANDUM.

THE following arrangement has been made between the Treasury and the Board of Trade for the purpose of simplifying accounts and improving administration.

At the present moment various public departments, the cost of which is borne by the Public Exchequer, render services to the Board of Trade on behalf of the Mercantile Marine, and for these a number of payments are made in detail out of the Mercantile Marine Fund. These are valued by the Board of Trade at £28,500 a year. These sums are now fixed at £21,660 a year, the items being as follows:—

Customs - -	£15,000	Shipping Offices and Light Dues, and Receivers of Wreck.
Works, England -	1,500	For rental of accommodation afforded in Custom Houses.
Works, Ireland - -	500	
Stationery Office -	3,000	
Audit Office - -	1,500	
Post Office - -	160	
	£21,660	

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Certain services now paid for out of public votes are to be charged on the Mercantile Marine Fund. These are as follows:—

Survey staff employed in surveying and inspecting emigrant ships, passenger steamships, and merchant ships generally, and in doing certain other work of a similar character, which will for the future include inquiries under the Boiler Explosions Act (present cost) - - - - - - -	£52,000
Expenses of obtaining casualty returns - -	2,500
Relief of distressed seamen - - - - -	30,000
	£84,500

On the other hand the following contributions are to be made to the Mercantile Marine Fund:—

The fees and charges recovered in respect of survey of ships which are now paid into the Exchequer - - - - - - - - -	£27,000
Unclaimed wages and effects of deceased seamen	9,000
Proceeds of unclaimed wreck - - - -	2,500
Grant in aid from Public Exchequer - - -	40,000
	£78,500

The payments for services rendered by one department to another, and the votes in aid, are to be revised quinquennially, so as to preserve a due proportion.

As between the Public Exchequer and the Mercantile Marine Fund, the effect of the arrangement will be to leave the gross amount paid on either side as nearly as possible the same as at present, but to make the payments in a less troublesome and more convenient form, and to appropriate to the respective funds those items of income and expenditure which properly belong to them.

The effect of abolishing the fees now received at Mercantile Marine Offices for engaging and discharging crews will be to relieve shipping and seamen from a charge of £70,000 a year.

As regards administration, the effect will be to settle questions

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long under discussion between the departments, and to place in the hands of the Board of Trade more unrestricted control over the services which they are authorised to administer.

The approval of Parliament will be given each year by the annual vote in aid. In addition, parliamentary powers were needed for the purpose of charging on the Mercantile Marine Fund the expenses above mentioned, of crediting that fund with the unclaimed wages and effects of seamen and the proceeds of unclaimed wreck, and of abolishing shipping office fees. The accompanying Act accordingly provides for these objects.

The cost of bringing home seamen to be tried in this country for offences committed abroad, which may under the existing Act be charged either on the vote for the relief of distressed seamen or as part of the costs of prosecution, will under this Act be paid in the same manner as other costs of prosecution.

MERCHANT SHIPPING (EXPENSES) ACT, 1882.

[45 & 46 *Vict.*, *Ch.* 55.]

An Act to amend the Law with respect to the Charges on and Payments to the Mercantile Marine Fund, and to Expenses of Prosecutions for Offences committed at Sea. [18th August, 1882.]

Whereas with a view to the adjustment of the receipts and expenditure under the Merchant Shipping Acts between the Mercantile Marine Fund and moneys provided by Parliament it is expedient to make the provision hereinafter mentioned:

Be it therefore enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

1. *Short title and construction.*—This Act may be cited as the Merchant Shipping (Expenses) Act, 1882.

This Act shall be construed as one with the Merchant Shipping Acts, 1854 to 1880, and together with those Acts may be cited as the Merchant Shipping Acts, 1854 to 1882 (17 & 18 Vict., c. 104, &c.)

2. *Commencement of Act.*—This Act (save as in this Act otherwise expressly provided) shall come into operation on the first day

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of April, one thousand eight hundred and eighty-three, which day is in this Act referred to as the commencement of this Act.

3. *Charges on Mercantile Marine Fund.*—There shall be charged on and payable out of the Mercantile Marine Fund the following sums, so far as they are not paid by any private person :—

(*a.*) The salaries of all surveyors and officers appointed and all expenses incurred in connexion with the survey and measurement of ships under the Merchant Shipping Acts, 1854 to 1876:

(*b.*) The salaries and expenses of persons employed under the Passengers Act, 1855, as amended by the Merchant Shipping Act, 1872 (18 & 19 Vict., c. 119; 35 & 36 Vict., c. 73):

(*c.*) The superannuation allowances, gratuities, pensions, and other allowances granted either before or after the passing of this Act to any of the said surveyors or persons :

(*d.*) The expenses of obtaining depositions, reports and returns respecting wrecks and casualties :

(*e.*) The allowances and expenses paid for the relief of distressed British seamen and apprentices, including the expenses declared by any of the Merchant Shipping Acts, 1854 to 1882, to be payable as such expenses, and any contributions to seamen's refuges and hospitals :

(*f.*) Any sums which the Board of Trade, in their discretion, think fit to pay in respect of claims to moneys carried to the Mercantile Marine Fund on account of the wages and effects of deceased seamen, or on account of the proceeds of wreck:

(*g.*) All costs and expenses incurred by the Board of Trade under the Boiler Explosions Act, 1882 (45 & 46 Vict., c. 22) (so far as not otherwise provided for), including any remuneration paid in pursuance of section seven of that Act, and any costs and expenses ordered by the court in pursuance of that Act to be paid by the Board of Trade.

4. *Payments to the Mercantile Marine Fund.*—There shall be accounted for and paid to the Mercantile Marine Fund—

(*a.*) All fees, charges, and expenses payable in respect of the survey or measurement of ships under the Merchant Shipping Acts, 1854 to 1876:

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(*b.*) All fees and other sums payable in respect of any services performed by any person employed under the authority of the Passengers Act, 1855, as amended by the Merchant Shipping Act, 1872:

(*c.*) The net proceeds of wreck which otherwise would be payable into the Exchequer under section four hundred and seventy-five of the Merchant Shipping Act, 1854, as amended by section fifty-three of the Merchant Shipping Act Amendment Act, 1862 (25 & 26 Vict., c. 63):

(*d.*) The moneys arising from the unclaimed wages and effects of deceased seamen, except where the same are required to be paid as directed by the Accountant General of Her Majesty's Navy:

(*e.*) All such sums in respect of expenses incurred with respect to distressed seamen and apprentices as are recovered by the Board of Trade under section two hundred and thirteen of the Merchant Shipping Act, 1854, and the enactments amending the same.

(*f.*) All costs and expenses ordered by the court to be paid to the Board of Trade in pursuance of the Boiler Explosions Act, 1882.

All the fees in this section mentioned shall be paid at such times and in such manner as the Board of Trade from time to time direct.

5. *Subsidy out of moneys provided by Parliament to the Mercantile Marine Fund.*—There shall be paid to the Mercantile Marine Fund out of moneys provided by Parliament an annual sum of forty thousand pounds, or after the expiration of five years from the commencement of this Act such other sum as may be from time to time determined by the Commissioners of Her Majesty's Treasury, with the concurrence of the Board of Trade, having regard to the receipts and expenditure of the Mercantile Marine Fund under sections three and four of this Act.

6. *Suspension of fees on engagements and discharges under* 17 *&* 18 *Vict., c.* 104, *s.* 125.—The Board of Trade may, if they think fit, at any time after the passing of this Act, abolish or suspend the fees payable upon engagements and discharges effected before

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shipping masters in pursuance of section one hundred and twenty-five of the Merchant Shipping Act, 1854, and in the event of such abolition, or pending such suspension, no deduction shall be made in pursuance of section one hundred and twenty-six of the said Act from the wages of any person engaged or discharged.

7. *Audit of accounts of Mercantile Marine Fund.*—The accounts of the Mercantile Marine Fund shall be deemed to be public accounts within the meaning of section thirty-three of the Exchequer and Audit Departments Act, 1866 (29 & 30 Vict., c. 39), and shall be examined and audited accordingly.

8. *Grant of pension to existing officers.*—Where a surveyor appointed under the Merchant Shipping Acts, 1854 to 1876, or a person employed under the Passengers Act, 1855, has in pursuance of section thirty-nine of the Merchant Shipping Act, 1876 (39 & 40 Vict., c. 80) received during part of his term of service his salary out of moneys provided by Parliament, his service during the period that his salary was paid out of moneys provided by Parliament, and his service during the period that his salary was paid out of the Mercantile Marine Fund shall be reckoned indifferently as the same service for the purpose of entitling him to any superannuation allowance, gratuity, pension, or other allowance, out of the Mercantile Marine Fund.

2. *Costs of prosecution for offences committed at sea.*—Such costs and expenses of and incidental to any prosecution for a felony or misdemeanour as are by law payable out of any county or other local rate shall, where such felony or misdemeanour was committed within the jurisdiction of the Admiralty of England, be paid in the same manner and subject to the same regulations as if such felony or misdemeanour had been committed in the county in which the same is heard and determined, or when the same is heard and determined at the Central Criminal Court as if the same had been committed in the county of Middlesex, and all sums properly paid out of any county or other local rate in respect of the said costs and expenses shall be repaid out of moneys provided by Parliament.

The expenses under section two hundred and sixty-eight of the Merchant Shipping Act, 1854, of imprisoning any such offender

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as therein mentioned, and of conveying him and the witnesses to the United Kingdom, or to such British possession as mentioned in that section, in any manner other than in the ship to which they respectively belong, shall, where not paid as part of the costs of the prosecution, be paid out of moneys provided by Parliament.

10. *Repeal.*—The Acts in the Schedule to this Act shall be repealed to the extent in the third column of that Schedule mentioned, without prejudice to anything done or suffered, or any right acquired or accrued in pursuance of the enactments hereby repealed.

SCHEDULE.

ENACTMENTS REPEALED.

A description or citation of a portion of an Act in this Schedule is inclusive of the word section or other part first and last mentioned, or otherwise referred to as forming the beginning or as forming the end of the portion described in the description or citation.

Session and Chapter.	Title.	Extent of Repeal.
7 Geo. 4, c. 64 ..	An Act for improving the administration of criminal justice in England.	Section twenty-seven.
4 & 5 Will. 4, c. 36	An Act for establishing a new court for the trial of offences committed in the metropolis and parts adjoining.	Section twenty-two from "and that it shall and "may be lawful for "any three" to the end of the section.
7 & 8 Vict., c. 2 ..	An Act for the more speedy trial of offences committed on the high seas.	Section one from "and "it shall be lawful for "the court to order," to the end of the section.
17 & 18 Vict., c. 104	The Merchant Shipping Act, 1854.	Section two hundred and two from "and subject "to the provision "hereinafter con- "tained" to the end of the section. Section two hundred and eleven from "out of "any moneys applic- "able" to "for the "purpose."

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Session and Chapter.	Title.	Extent of Repeal.
		Section two hundred and sixty-eight from "and "the expense of im- "prisoning" to the end of the section.
		Section four hundred and twenty-eight.
39 & 40 Vict., c. 80..	The Merchant Shipping Act, 1876.	Section thirty-nine from the beginning down to "vested in the Board "of Trade," and the words "there may be "paid out of moneys "provided by Parlia- "ment all costs and "compensation pay- "able by the Board of "Trade in pursuance "of this Act."
40 & 41 Vict., c. 44..	The Superannuation (Mercantile Marine Fund Officers) Act, 1877.	The whole Act.

THE EGYPTIAN WAR.

SINCE the article on the naval operations at Alexandria was in the press, the war has suddenly collapsed in a fashion truly Oriental. The heroic storming of the lines of Tel-el-Kebir shattered Arabi's power so effectually that his generals from Kafrdawar to Cairo resigned themselves to the inevitable. For the first time since armies were supplied with breechloaders an inferior force of Englishmen marched coolly up to works which were deemed impregnable and in defiance alike of artillery, and rifle bullets, carried them at the point of the bayonet. The élite of the troops of Von Moltke would doubtless have essayed the feat but up to the present the honour is due only to the warriors of "the thin red line." There is not a Mussulman centre where the news will fail to be a theme of wonder, nor a bazaar in which men of all creeds will not speak of it. Nor will the effects be confined to the swarthy races of the east. The Frank, the Teuton, and our white-skinned brethren on

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the other side of the Atlantic, will secretly, if not openly, pay a tribute to the endurance, courage, and generalship which has by one bold effort suppressed the greatest revolt since the Indian Mutiny. The result clearly indicates that the Asiatic, notwithstanding the most careful training and discipline, lacks the moral power which Anglo-Saxon leadership inspires, and without which an army soon deteriorates into a mob ready for flight at the first signs of a reverse. What makes the exploit the more remarkable is the fact that the season of the year was the worst imaginable for unseasoned or seasoned white troops. While our men must necessarily be stricken down by sunstroke, by dysentery, and by fever, the thick-skulled Egyptian or the negro from the Soudan would scarcely feel evils which always slay more than the bullets of an enemy.

The soldier and the sailor have done their part, and must leave the drama to be concluded by diplomacy. Whatever the political opinions of Englishmen in general may be of the causes which led up to the war, they are at least unanimous in expressing a determination not to lose its fruits by the dictum of Europe, and greatly as such a course would be regretted, it is within the bounds of possibility that her representatives may have to enter Congress with shotted guns. Nations whose statesmen looked on with indifference, or, as far as they dared, indirectly encouraged Arabi, can scarcely expect at the final settlement to be listened to as they would have been had they shared the hardships and the expenses of the war. Prominent in this list stands the country which owes its very existence to England. It will be an evil day for Italians if ever a hostile English fleet appears in the Bay of Naples. The watch of its commander will again be laid on the table, and short shrift given for submission. It is the old, old story of the gods helping those who help themselves. The inhabitants of Great Britain have rarely derived benefit from their allies, notwithstanding that at the commencement of operations events appeared to shape so favourably. To the end the advice of Cromwell to his soldiers best suits our policy and our interest.

W.

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TIDE TABLES FOR OCTOBER, 1882.

Also Ports of Reference for the Constants in the next Table.

WEEK DAY.	MONTH DAY.	LONDON BRIDGE.		HULL.		NORTH SHIELDS		LEITH.		DEVONPORT.		DOVER.		WESTON-SUPER-MARE.		LIVERPOOL.		GREENOCK.		QUEENSTOWN		KINGSTOWN.		LONDONDERRY.		BREST.	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
		H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
S	1	4 17	4 38	8 53	9 15	5 48	6 11	4 42	5 5	8 4	8 25	1 27	1 50	9 15	9 34	1 24	1 45	2 14	2 35	7 28	7 49	1 16	1 39	10 18	10 41	6 9	6 31
M	2	4 59	5 22	9 38	10 1	6 34	6 58	5 29	5 54	8 45	9 5	2 13	2 36	9 53	10 12	2 7	2 30	2 56	3 18	8 11	8 33	2 3	2 28	11 9	11 40	6 54	7 19
T	3	5 46	6 10	10 26	10 55	7 24	7 53	6 20	6 49	9 27	9 50	2 59	3 23	10 32	10 56	2 53	3 18	3 41	4 6	8 56	9 21	2 53	3 20	—	0 16	7 46	8 14
W	4	6 37	7 7	11 30	—	8 27	9 5	7 22	7 59	10 17	10 48	3 49	4 19	11 26	—	3 48	4 23	4 34	5 6	9 51	10 27	3 52	4 28	0 56	1 40	8 46	9 23
T	5	7 40	8 16	0 8	0 46	9 46	10 26	8 39	9 20	11 24	—	4 51	5 26	0 2	0 41	5 3	5 46	5 42	6 21	11 6	11 47	5 6	5 44	2 24	3 3	10 4	10 47
F	6	8 59	9 44	1 24	2 1	11 6	11 43	10 0	10 36	0 4	0 45	6 3	6 41	1 22	2 2	6 30	7 10	7 1	7 40	—	0 26	6 21	6 57	3 39	4 12	11 28	—
S	7	10 23	10 58	2 37	3 11	—	0 16	11 10	11 40	1 25	2 3	7 19	7 53	2 40	3 17	7 46	8 17	8 17	8 50	1 4	1 40	7 30	8 3	4 41	5 5	0 0	0 33
S	8	11 30	11 57	3 43	4 10	0 45	1 11	—	0 6	2 35	3 3	8 22	8 45	3 50	4 18	8 44	9 6	9 19	9 44	2 10	2 35	8 31	8 55	5 27	5 47	1 6	1 30
M	9	—	0 22	4 38	4 52	1 33	1 51	0 27	0 45	3 8	3 51	9 6	9 25	4 42	5 5	9 25	9 42	10 4	10 23	2 56	3 16	9 17	9 36	6 5	6 23	1 49	2 7
T	10	0 42	1 2	5 9	5 26	2 8	2 25	1 2	1 19	4 12	4 32	9 44	10 2	5 25	5 41	9 59	10 16	10 41	10 59	3 35	3 53	9 53	10 8	6 40	6 57	2 21	2 41
W	11	1 18	1 35	5 43	6 0	2 40	2 55	1 36	1 52	4 51	5 8	10 20	10 38	6 3	6 21	10 32	10 48	11 17	11 35	4 10	4 27	10 23	10 38	7 14	7 31	3 7	3 13
T	12	1 52	2 6	6 17	6 33	3 10	3 25	2 8	2 23	5 24	5 40	10 56	11 13	6 38	6 55	11 4	11 20	11 52	—	4 44	5 1	10 53	11 8	7 47	8 2	3 23	3 45
F	13	2 20	2 36	6 49	7 5	3 40	3 56	2 38	2 53	5 56	6 12	11 30	11 47	7 11	7 26	11 36	11 52	0 9	0 25	5 17	5 33	11 24	11 40	8 16	8 30	4 1	4 16
S	14	2 52	3 6	7 21	7 36	4 12	4 28	3 8	3 23	6 27	6 42	—	0 4	7 41	7 57	—	0 8	0 41	0 57	5 49	6 5	11 56	—	8 44	8 58	4 31	4 47
S	15	3 22	3 38	7 51	8 7	4 44	5 1	3 39	3 55	6 57	7 12	0 22	0 40	8 13	8 29	0 24	0 40	1 18	1 29	6 21	6 38	0 12	0 29	9 13	9 29	5 8	5 19
M	16	3 55	4 10	8 24	8 42	5 18	5 36	4 12	4 30	7 28	7 45	0 58	1 16	8 45	9 1	0 56	1 13	1 45	2 2	6 55	7 14	0 46	1 5	9 46	10 4	5 36	5 55
T	17	4 28	4 46	9 1	9 20	5 55	6 16	4 50	5 11	8 2	8 20	1 36	1 56	9 18	9 36	1 31	1 50	2 21	2 40	7 33	7 53	1 25	1 46	10 24	10 48	6 14	6 34
W	18	5 8	5 25	9 40	10 4	6 38	7 8	5 34	6 0	8 39	9 2	2 17	2 40	9 54	10 14	2 10	2 33	3 0	3 22	8 13	8 36	2 8	2 32	11 17	11 50	6 53	7 25
T	19	5 48	6 14	10 32	11 4	7 31	8 :	6 27	6 57	9 28	9 56	3 4	3 29	10 36	11 3	2 58	3 26	3 46	4 13	9 1	9 29	2 58	3 23	—	0 27	7 53	8 23
F	20	6 42	7 10	11 42	—	8 38	9 18	7 32	8 11	10 28	11 5	3 57	4 28	11 37	—	3 57	4 34	4 43	5 17	10 1	10 40	4 2	4 40	1 9	1 54	8 57	9 37
S	21	7 53	8 33	0 21	1 0	10 0	10 41	8 54	9 36	11 47	—	5 4	5 41	0 16	0 56	5 18	5 .3	5 56	6 36	11 21	—	5 20	5 58	2 38	3 17	10 20	11 3
S	22	9 16	9 58	1 38	2 15	11 20	11 55	10 14	10 48	0 31	1 14	6 18	6 56	1 37	2 17	6 47	7 25	7 16	7 55	0 2	0 41	6 35	7 9	3 52	4 21	11 43	—
M	23	10 35	11 10	2 50	3 21	—	0 27	11 20	11 48	1 54	2 29	7 32	8 4	2 56	3 32	7 59	8 27	8 30	9 1	1 19	1 52	7 42	8 13	4 47	5 10	0 18	0 48
T	24	11 40	—	3 52	4 18	0 54	1 18	—	0 12	3 0	3 28	8 32	8 57	4 4	4 34	8 53	9 16	9 29	9 55	2 21	2 48	8 42	9 8	5 52	6 15	1 16	1 40
W	25	0 8	0 34	4 41	5 4	1 41	2 3	0 36	0 58	3 55	4 21	9 22	9 47	5 2	5 29	9 39	10 2	10 21	10 47	3 13	3 38	9 32	9 55	6 48	7 11	2 16	2 40
T	26	0 56	1 20	5 28	5 52	2 25	2 47	1 21	1 44	4 46	5 10	10 12	10 38	5 55	6 21	10 25	10 48	11 12	11 36	4 8	4 28	10 16	10 38	7 6	7 30	3 12	3 36
F	27	1 41	2 6	6 16	6 40	3 9	3 32	2 7	2 30	5 35	5 56	11 4	11 30	6 46	7 10	11 11	11 34	—	noon	4 53	5 17	11 0	11 24	7 53	8 15	3 55	4 18
S	28	2 27	2 51	7 4	7 27	3 56	4 18	2 52	3 14	6 19	6 41	11 56	—	7 33	7 54	11 57	—	0 21	0 47	5 40	6 2	11 46	—	8 35	8 55	4 21	4 43
S	29	3 18	3 44	7 48	8 10	4 41	5 4	3 38	4 0	7 2	7 23	0 19	0 43	8 16	8 36	0 20	0 42	1 10	1 34	6 24	6 46	0 9	0 32	9 16	9 37	5 5	5 27
M	30	4 10	4 36	8 34	8 55	5 25	5 50	4 24	4 44	7 45	8 6	1 7	1 30	8 59	9 19	1 4	1 26	1 54	2 16	7 8	7 30	0 55	1 18	9 59	10 21	5 49	6 12
T	31	4 59	5 25	9 19	9 41	6 10	6 33	5 8	5 32	8 31	8 53	1 53	2 16	9 45	10 5	1 54	2 16	2 37	2 59	7 51	8 12	1 43	2 6	10 45	11 14	6 33	6 58

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TIDAL CONSTANTS

For Various British, Irish, and European Ports.

By applying the Tidal Constant of the place, according to its sign (+ *add* − *sub.*), to the time of high water on the given day at the port of reference, you have the time of high water at the place sought.

Place.	Constant.	Port of Reference.
	H. M.	
Aberdeen	−1 17	Leith
Aberystwyth	−3 52	Liverpool
Alderney	+2 50	Brest
Antwerp	+5 13	Dover
Arbroath	−0 42	Leith
Arcachon	+0 50	Brest
Arklow	−2 25	Kingstown
Ayr	−0 18	Greenock
Banff	−1 49	Leith
Bantry harbour	−1 14	Queenstown
Barnstaple bridge	−0 26	Weston-s.-Mare
Bayonne	−0 2	Brest
Beachy head & Rye bay	+0 8	Dover
Beaumaris	−0 51	Liverpool
Belfast	+2 43	Londonderry
Berwick	−1 5	N. Shields
Blyth	−0 8	N. Shields
Bordeaux	+3 3	Brest
Boulogne	+0 18	Dover
Bridport	+0 23	Devonport
Bristol & King Road	+0 19	Weston-s.-Mare
Cadiz	−2 2	Brest
Caernarvon	−1 56	Liverpool
Calais	+0 37	Dover
Campbellton	−0 28	Greenock
Cardiff	+0 2	Weston-s.-Mare
Cardigan bar	−4 22	Liverpool
Carlingford bar	−0 10	Kingstown
Chatham	−0 47	London
Cherbourg	+4 2	Brest
Coleraine	−1 37	Londonderry
Coquet Road	−0 38	N. Shields
Cordouan Tower	−0 10	Brest
Cowes (West)	−0 27	Dover
Crinan	+4 41	Greenock
Cromarty	−2 21	Leith
Dartmouth	+0 33	Devonport
Deal & Downs	+0 8	Dover
Dieppe	+7 19	Brest
Donaghadee	+0 3	Kingstown
Donegal harbour	+0 17	Queenstown
Douglas & Ramsay	−0 11	Liverpool
Dublin bar	+0 2	Kingstown
Dundalk	−0 16	Kingstown
Dungeness	−0 27	Dover
Dunkerque	+0 56	Dover
Exmouth	+0 38	Devonport
Falmouth	−0 46	Devonport
Fecamp	+6 57	Brest
Ferrol	−0 47	Brest
Flamborough head	−1 59	Hull
Fleetwood	−0 12	Liverpool
Folkestone	−0 5	Dover
Fowey	−0 29	Devonport
Flushing	+1 42	Dover
Galway bay	−0 26	Queenstown
Gibraltar	−1 27	Brest
Glasgow (Port)	+0 10	Greenock
Gloucester	+2 51	Weston-s.-Mare
Granville	+0 26	Brest
Gravesend	−0 48	London
Grimsby (Great)	−0 53	Hull
Guernsey (St. Peter)	+2 50	Brest
Hartlepool	+0 5	N. Shields
Harwich	−1 52	London
Havre	+6 4	Brest
Helgoland	+0 21	Dover
Holyhead	−1 12	Liverpool
Holy Island harbour	−0 58	N. Shields
Honfleur	+5 42	Brest
Inverness	−1 59	Leith

Place.	Constant.	Port of Reference.
	H. M.	
Jersey (St. Helier)	+2 38	Brest
Kinsale	−0 18	Queenstown
Lerwick (Shetland)	−8 47	Leith
Limerick	+1 15	Queenstown
Lisbon Bar	−1 17	Brest
Littlehampton	+0 24	Dover
Llanelly bar	−0 38	Weston-s.-Mare
Lowestoft	−4 1	London
Lynn & Boston Deep	−0 29	Hull
Margate	−2 18	London
Maryport	+0 3	Liverpool
Milford Haven entr.	−0 58	Weston-s.-Mare
Montrose	−0 52	Leith
Morlaix	+1 6	Brest
Needles point	−1 26	Dover
Newcastle	+0 23	N. Shields
Newhaven	+0 39	Dover
Newport	+0 16	Weston-s.-Mare
Nieuport	+1 6	Dover
Nore	−1 28	London
Orfordness	−2 48	London
Oporto	−1 17	Brest
Ostende	+1 18	Dover
Padstow	−1 41	Weston-s.-Mare
Peel, Isle of Man	−0 15	Liverpool
Pembroke Dock	−0 42	Weston-s.-Mare
Penzance	−1 18	Devonport
Peterhead	−1 43	Leith
Piel harbour, Barrow	−0 18	Liverpool
Plymouth breakwater	−0 6	Devonport
Poole	−2 2	Dover
Port Carlisle	+0 47	Liverpool
Portland breakwater	+1 18	Devonport
Port Patrick	−0 58	Greenock
Portsmouth	+0 29	Dover
Ramsgate	−2 19	London
Rotterdam	+4 38	Dover
Santander	−0 17	Brest
Scarborough	+0 48	N. Shields
Selsea bill	+0 33	Dover
Sheerness	−1 21	London
Shoreham	+0 22	Dover
Sligo bay	+0 17	Queenstown
Southampton	−0 42	Dover
Spurn point	−1 3	Hull
St. Ives	−2 10	Weston-s.-Mare
St. Malo	+2 18	Brest
St. Mary (Scilly)	−1 16	Devonport
St. Nazaire	−0 7	Brest
Stornoway	+6 38	Greenock
Stromness (Orkneys)	−5 17	Leith
Sunderland	−0 1	N. Shields
Swansea bay	−0 53	Weston-s.-Mare
Tay bar	−0 11	Leith
Tees bar	+0 22	N. Shields
Tenby	−1 12	Weston-s.-Mare
Thurso	−5 49	Leith
Torbay	+0 17	Devonport
Tralee bay	−0 58	Queenstown
Ushant (Ouessant)	−0 15	Brest
Valentia harbour	−1 19	Queenstown
Waterford	+0 19	Queenstown
Westport	−0 4	Queenstown
Wexford	+2 20	Queenstown
Whitby	+0 22	N. Shields
Whitehaven	−0 9	Liverpool
Wick	−2 55	Leith
Wicklow	−0 41	Kingstown
Workington	−0 19	Liverpool
Yarmouth road	−4 48	London
Youghall	+0 18	Queenstown

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BOOKS RECEIVED.

Particulars of Dry Docks, &c., on the Thames. Compiled by CHARLES H. JORDAN, M.I.N.A., Surveyor to the Underwriters Registry for Iron Vessels. London: E. and F. N. Spon, 16, Charing Cross. 1882.

MR. JORDAN has published a comprehensive sheet which cannot fail to be of great service to shipowners, shipmasters, surveyors, and others who have to do with dry docks, floating docks, pontoons, slips, and gridirons on the Thames. Mr. Jordan shows where the docks are situated, what are their respective capabilities, who are the proprietors, and supplies sundry other useful details concerning them. It is only necessary to make known the existence of such a publication, the compiler's reputation and position are sufficient guarantee that the information given is accurate. It is sold either in covers or on a cardboard sheet for hanging up.

The British Navy: its Strength, Resources and Administration. By Sir THOMAS BRASSEY, K.C.B., M.P., &c., &c. Volume III. Opinions on the Shipbuilding Policy of the Navy. London: Longmans. 1882.

THIS volume of Sir Thomas Brassey's great work is devoted to the opinions which have been expressed from time to time by various authorities on the types, dimensions, armour, and armament of the vessels of the Royal Navy, and on torpedoes and torpedo vessels. This compilation of opinion is a valuable one, and we observe two marked features about it, viz. (1), that a strong feeling is expressed in favour of some smaller and more rapid ships being built, and (2) that many are of opinion that exaggerated thickness of armour and enormously-sized guns are not likely to be of the greatest importance in the naval warfare of the future. Handy guns and handy vessels seem to find the greatest favour with naval men, while naval architects, shipbuilders, engineers and gun manufacturers would like to continue the development of both guns and armour *ad infinitum*. The views of foreigners presented in Sir Thomas Brassey's compilation are most interesting and useful.

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Our Library Table.

The usual *Notices to Mariners* and *Hydrographic Notices*, British and Foreign, are to hand, and their substance recorded in our pages. We have, in addition, on our table the following books, pamphlets, and papers:—*Supplement, No.* 1, *to the Fourteenth Annual Report of the Department of Marine and Fisheries*, for the fiscal year ended 30th June, 1881 (Ottawa), gives copious information respecting steamboat inspection, and the examination of masters and mates in the Dominion, together with other serviceable details. *Van Nostrand's Engineering Magazine* (New York), for September, among other original articles, introduces a "new form of vernier," by Lieutenant H. H. Ludlow, U.S.A., which is worthy of careful consideration by those interested in devices for accurate measurement. *Annalen der Hydrographie und Maritimen Meteorologie*, Heft VIII., among other papers notices Puerto Oliva in Chile, a new port not mentioned in sailing directions; it lies about seven miles north of Taltal Point, in lat. 25° 18′ S. *Revista Maritima Brazileira* (Rio de Janeiro), for June and July. *Revue Maritime et Coloniale* (Paris), for August and September, has a few remarks on the Azimuth Compass which will be read with interest. The latest numbers of *Rivista Marittima* (Roma), *Hansa*, *Das Schiff*, *Le Yacht*, the *New York Maritime Register*, *Forest and Stream*, the *Nautical Gazette* (U.S.), and the *American Ship* are to hand. *Meteorological Observations at Stations of the Second Order*, for the year 1879, is chiefly a tabular arrangement of observations made at various places in the United Kingdom, and is issued by the Meteorological Council. From the same source we have *The Storm of October* 13-14, 1881, which shows the minuteness with which telegraphic reports enable the history of such a storm to be traced and the necessary warnings of its approach issued. Those who use *Napier's Diagram* will find a very useful form of it, issued by Edwin Langford, of Bristol; the dotted line is so set off that each dot represents a degree, and a curve can thus be struck without the use of dividers; a very handy process, at once quick and correct.

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MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
325	England—South Coast—Longships	Light to be altered in character in 1883.
326	„ „ Newhaven	Bell buoy altered in position.
327	„ East Coast — Dudgeon and Lynn Well Lights	Altered in character.
328	„ „ Shipwash and Outer Dowsing Lights	To be altered in character in 1883.
329	„ West Coast—Bristol Channel —Trevose Head	Alteration in lights.
330	„ „ Bristol Channel—Nash and Culver Sands, and West Usk	Alteration in buoyage.
331	„ „ Bristol Channel—Breaksea Lightship	Altered in position.
332	„ „ Cardigan Bay—St. Tudwall Roads	New buoy.
333	Scotland—West Coast—Sanda Light	To be altered in character and power.
334	Ireland—North Coast—Lough Foyle—Tuns Bank	Buoy altered in character and colour.
335	„ South Coast—Waterford Harbour—Duncannon Fort Upper Light	To be altered in character.
336	France—North Coast—Baie de Mont St. Michel—Pierre de Herpin	New light.
337	„ „ St. Valery-en-Caux	New fog-signal on West Jetty.
338	North Sea—East Schelde — Schouwen Island	Permanent light re-exhibited.
339	Norway—West Coast—Bergen — Stromhellen Point	New light.
340	Baltic—Gulf of Bothnia—South Quarken —Understen	New fog-signal.
341	France—West Coast—Ile de Ré—Baleines	Electric light established.
342	Mediterranean—France—Toulon—Ane Bank Light	Arc of visibility altered.
343	„ Gulf of Athens—Ægina	New light, &c.
344	„ Morea—Stamphani	Light uncertain.
345	„ Archipelago — Sikino Island	Discovery of shoal.
346	„ Egypt—Alexandria	Shoal at entrance to new port.
347	Black Sea—Bug River—Fort Konstantine	New harbour light.
348	„ Soujak Bay—Penai Point	Light altered.
349	Africa—West Coast—Cape Verde Islands —St. Vincent—Bird Island	Particulars of new light.
350	„ East Coast—Chuluwan Island—Chingani Point	New light.
351	Bay of Bengal—Madras Harbour	Precaution on approaching.
352	China Sea—Gulf of Siam	Discovery of shoal.
353	China—East Coast—Min River Approach	Discovery of sunken rock.
354	„ Gulf of Pechili—Miau-tan Islands —Houki Island	Permanent light exhibited.
355	Australia—East Coast—Inner Route—Dugdale Rock	Reported sunken danger.
356	South Pacific—Fiji Islands—Viti Levu —Suva Harbour—Ma Mbukalou	Alteration in light.
357	United States—Pacific Coast—California —San Francisco	Bell buoy to mark wreck.
358	South America—Brazil—Cape St. Thomé	New light.

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MONTHLY ABSTRACT OF NAUTICAL NOTICES—*Continued.*

No.	PLACE.	SUBJECT.
359	UNITED STATES — Mississippi — Pass Christian	Light discontinued.
360	„ Maryland—Potomac River—Upper Cedar Point	Re-exhibition of light.
361	„ „ Kent Island—Bloody Point Bar	New light.
362	„ Atlantic Coast—Fisher Island Sound	Position of rocks determined.
363	„ Maine — Whitehead Lighthouse	Alteration in fog-signal.

NAUTICAL NOTICES.

All Bearings Magnetic, unless otherwise stated.

325.—ENGLAND.—*South Coast.—Longships Light.—Alteration in Character.*—It is the intention early in the month of January, 1883, to alter the present character of the Longships Light, so that it shall thereafter be *intermittent*, having the ordinary appearance of a *fixed* light, varied by a *sudden eclipse of three seconds'* duration *once in every minute.* Also, during foggy weather, two explosive reports (each sounding like the discharge of a gun) will be given every 10 minutes; the interval between the two reports will be 5 seconds. Further notice will be given when the alteration is effected.

326.—ENGLAND.—*South Coast.—Newhaven Harbour Entrance. —Alteration in Position of Bell Buoy.*—In consequence of the extension of the breakwater, the following alteration is about to be made in the position of the Bell buoy placed off the extremity of the works in progress:—The buoy (red) will be moored with Newhaven outer western lighthouse bearing N. by E. $\frac{3}{4}$ E. distant about 4 cables.

Note.—Vessels should pass eastward of this buoy.

327.—ENGLAND.—*East Coast.—Alteration in Character of the Dudgeon and Lynn Well Lights.*—In accordance with Notice issued in 1881 the alteration in character of the Dudgeon floating light has been effected, so that a *double flashing light*, comprising one

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white and one *red flash* following each other *in quick succession*, is now shown therefrom *every half-minute*. The red flash will be as nearly as possible equal in power with the white, and the approximate proportions of time will be, for white flash 2½ seconds, darkness 2½ seconds, red flash 2½ seconds, darkness 22½ seconds. Also the revolution of the Lynn Well floating light has been accelerated, so that a *white flash* is now shown therefrom every 10 *seconds*.

328.—ENGLAND.—*East Coast.—Shipwash and Outer Dowsing Light-Vessels.—Alteration in Character.*—Early in 1883 the character of the Shipwash light will be altered to *a white double flashing half-minute* light, showing two successive flashes of about 2½ seconds' duration, divided by an eclipse of about 4 seconds, the second flash being followed by an eclipse of about 21 seconds. Also, the Outer Dowsing light will be improved in intensity, and will be red revolving as at present, but showing a flash at periods of 30 seconds instead of 20 seconds. Further notice will be published when the changes are effected.

329.—ENGLAND. — *West Coast.—Bristol Channel. — Trevose Head.—Discontinuance of Low Light, and Alteration in Character of High Light.*—With reference to Notice 150, p. 383, on intended discontinuance of the low light, and alteration in character of the high light, at Trevose head:—The low light has been discontinued, and the high light made *occulting*. The high light is under *occultation three times* in quick succession *every minute*. That is to say, it suddenly disappears for *three seconds*, and then, as suddenly reappears at full power for *three seconds*; again suddenly disappears for *three seconds*, reappears at full power for *three seconds*; again disappears for *three seconds*, and suddenly reappears at full power for the remainder of the *minute*.

330.—ENGLAND.—*West Coast.—Bristol Channel.—Nash and Culver Sands.—Alterations in Buoyage.*—With reference to Notice 214, p. 549, on intended alteration in position of West Nash buoy and buoyage of Culver sand, the following alterations have been made:—*West Nash buoy* has been moved 6¼ cables S.E. by E. of its former position, and now lies in 5¼ fathoms, with Newtown down mill stump in line with the coastguard flagstaff at Porth-

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cawl, N.E. by E., N$^{by.}$; Nash high lighthouse, its height open northward of the low lighthouse, S.E. ¼ E., E$^{by.}$; East Scarweather buoy, N. ¼ W., distant 2$\frac{4}{10}$ths miles.

An 8-feet red *can* buoy marked *North Culver buoy*, has been placed on the north side of Culver sand in 5 fathoms, with a conspicuous clump of trees on high back land, twice its width open eastward of Barry church, N. ¼ E.; Swallow point in line with south side of Steepholm island, E. by N.; West Culver buoy, W. ¼ N., distant 2$\frac{1}{10}$th miles.

East Culver buoy has been moved 3½ cables S.E. by E. of its former position, and now lies in 23 feet, with the chancel end of Penarth church in line with Lavernock point, N.N.E.; Burnham low lighthouse, midway between the high lighthouse and a conspicuous tower on a hill (Glastenbury) to the right, S.E. ¼ S.; Gore buoy, S. ¼ E., distant 4$\frac{2}{10}$ ths miles.

(2.) *Usk River Entrance.—Alterations in West Usk Buoy.*—A *bell* buoy, painted red and white in vertical stripes, has been substituted for the old West Usk buoy.

331.—ENGLAND.—*Bristol Channel.—Breaksea Light.—Alteration in Position.*—It is intended shortly to move the Breaksea lightship into deeper water, about 4 cables to the north-eastward of her present position. Due notice will be given when the change has been effected.

332.—ENGLAND.—*West Coast.—St. Tudwall Roads, Cardigan Bay.—"Sand Spit" (New Buoy).*—A 6-ft. nun buoy, painted red, has been placed on the southern spit of the sand which extends into St. Tudwall roadstead. The buoy lies in 2¾ fathoms low water spring tides, with the following mark and bearings, viz.:—Porth Back point, W. by S. ¼ S. (distant 6½ cables); Abersoch point, N. W. ¼ N. (distant 9½ cables); St. Tudwall lighthouse, S. by W. ¼ W. (distant 1 mile 2 cables).

333.—SCOTLAND.—*West Coast.—Sanda Lighthouse.—Firth of Clyde.—Off the Mull of Kintyre.*—It is intended to alter the character and increase the power of the Sanda light, Firth of Clyde, and during the alterations a temporary light of the same character as the present light, but of less power, will be exhibited. The character of the light, after being altered, will be *intermittent white, the*

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periods of light being 8 *seconds, and the periods of darkness* 16 *seconds.* The operations required for the change will be completed about the middle of October, and the installation of the new light will take place about that period. The exact date will, however, be previously intimated.

334.—IRELAND.—*North Coast.—Lough Foyle.—North Channel. —Tuns Bank Buoy.—Alteration in Character and Colour.*—On or about 15th September, 1882, the black buoy marking the North end of Tuns bank, Lough Foyle entrance, would be replaced by a *bell* buoy with staff and cage—the colour of the buoy will be altered to red. All depths given are at low water spring tides.

335.—IRELAND.—*South Coast.—Waterford Harbour.—Duncannon Fort Upper Light.—Intended Sector of Red Light.*—On 1st December, 1882, Duncannon fort upper light will show *red* through an arc of 45°, or between the bearings of S. $\frac{3}{4}$ E. (leading clear of Drumroe bank buoys), and S.E. $\frac{1}{4}$ E.; and will show *white* eastward of the bearing S. $\frac{3}{4}$ E. to the shore. *Variation*, 22$\frac{1}{4}$° *W.*

336.—FRANCE.—*North Coast.—Baie de Mont St. Michel.— Light on Pierre de Herpin.*—On October 1, 1882, a light will be exhibited from a lighthouse recently erected on Pierre de Herpin, north-eastward of Grouin Point, approach to Cancale Road. The light will show alternately a *fixed white* light and a *flashing green* light during intervals of *thirty seconds*, elevated 62 feet above high water, and visible from a distance of 14 miles. The lighthouse, 80 feet high and constructed of masonry, is cylindrical in shape. Position on Admiralty chart, lat. 48° 43′ 50″ N., long. 1° 48′ 40″ W.

337.—FRANCE. — *North Coast.—St. Valery-en-Caux. — Fog-Signal on West Jetty.*—The signal is a bell, which, during thick or foggy weather, will give groups of *twenty sounds*, with an interval of *twenty seconds* between each group. A double sound will be given in the middle of the intervals, when there is at least 8$\frac{1}{2}$ feet water in the harbour channel.

338.—NORTH SEA.—*East Schelde.—Schouwen Island.—Permanent Light Re-Exhibited, Provisional Light Discontinued.*— With reference to Notice 220, p. 551, the permanent light is re-

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exhibited, and the provisional light discontinued. The light is a *white double flashing half-minute* light, showing *two flashes* of *two and a quarter seconds'* duration each, divided by an eclipse of *five and a quarter seconds'* duration; the second flash being followed by an eclipse of *twenty and a quarter seconds.*

339.—Norway.—*West Coast.—Bergen.—Light on Stromhellen Point.*—On 1st September, 1882, a light will be exhibited from the keeper's dwelling on the extremity of Stromhellen (Stromhelle) point, Vatle (Vatlestrom) channel, approach to Bergen. The light, elevated 20 feet above high water, will show *fixed red* between the bearings of N. 42° W. (indicating Helleren shoal) and N. 22° W. (leading about one cable westward of Aarholmen); and *fixed white* from N. 22° W., through north and east, to S. 42° E. (leading southward of Bratholmen). The direction in which the change of colour occurs indicates nearly mid-channel. Position, lat. 60° 20′ 20″ N., long. 5° 11′ 20″ E. Shown from 15th July to 15th May.

Note.—Stromhellen point may be passed at the distance of about a quarter of a cable. With the white light in sight, vessels will clear the wreck of the steam-vessel *Sportsman*; the vessel marking this wreck will be withdrawn on 1st September, 1882—should the wreck not be removed on that date, a mark will be placed thereon. It is intended to erect a beacon on Stangen rock. *Variation*, 18° *W.*

340.—Baltic.—*Gulf of Bothnia.—South Quarken.—Fog-Signal near Understen Lighthouse.*—Established near Understen Lighthouse, western side of South Quarken. The signal is a steam-siren, with a rotary motion occupying *four minutes*, which, during thick or foggy weather, will be sounded seaward (through three-fourths of the horizon) *nine* times in *three minutes*. In the direction of the land, traversed in *one minute*, the signal gives no sound.

341.—France.—*West Coast.—Ile de Ré.—Electric Light at Baleines, and Discontinuance of Provisional Light.*—With reference to Notice 265, p. 635, on intended establishment of an *electric* light, and exhibition of a provisional light, at Baleines, the N.W. extreme of Ile de Ré; on 1st October, 1882, the *electric* light will be exhibited, and the provisional light discontinued.

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The light will be a *flashing white* light, showing a succession of groups of *four flashes*, the interval between two consecutive groups being three times as long as that between the flashes of one group; the light should be visible from a distance of 24 miles.

342.—MEDITERRANEAN.—*France.—Toulon.—Ane Bank Light.—Alteration in Arc of Visibility.*—The green light shown from the light-vessel (*L'Indicateur*) moored near the extremity of Ane bank, Toulon road, is now obscured towards the offing, and is only visible westward of the lines joining the light-vessel to the southern extremity of the great pier, and to Grosse tour.

343.—MEDITERRANEAN.—*Gulf of Athens.—Ægina.*—(1.) *Light on Cape Plaka.*—Exhibited from a round turret of yellow-coloured stone on cape Plaka, N.W. extreme of the island of Ægina. It is a *fixed* light, showing *white* to the northward and eastward, and *red* to the westward; elevated 36 feet above the sea (19 feet above the ground), and visible from a distance of about 4 miles. Position, lat. 37° 45′ 40″ N., long. 23° 25′ 20″ E.

(2.) *Port of Ægina.—Colour of Harbour Light.*—The harbour light (fixed) exhibited on the extremity of the north mole, at the port of Ægina, now shows *red* in all directions.

344. — MEDITERRANEAN. — *Morea.—West Coast. — Strovathi Islands.—Stamphani Islet Light Uncertain.*—The commander of H.M.S. *Salamis* reports, when passing Strovathi islands between 4h. and 5 a.m. of 8th August, 1882, Stamphani islet light was not burning. Mariners are cautioned accordingly.

345.—MEDITERRANEAN.—*Archipelago.—Sikino Island.—Shoal between Kardiotissa and Karavos Islets.*—Lying in the channel between Kardiotissa and Karavos islets, distant about 3¼ cables from Karavos islet. The shoal (indicated by sudden change in colour of the water) extends about 220 yards in a N.E. and S.W. direction, with a least depth of about 23 feet over it, and lies with the following approximate bearings:—Summit of Avolatha-nisi rock, N. 42½° E.; South extreme of Kaloyeros islet, S. 72° E. These bearings place the shoal in approximately, lat. 36° 37′ 55″ N., long. 25° 8′ 5″ E. *Variation*, 6½° *W.*

346. — MEDITERRANEAN. — *Egypt. — Alexandria. — Shoal of Entrance to New Port.*—Lying about 7 cables northward of the

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entrance to the New Port, Alexandria. This shoal (*Bittern shoal*) with a least depth of 5 fathoms, obtained by the *Bittern* when passing over it on passage from Alexandria to Abukir (Aboukir) bay, lies with the following approximate bearings and distance :—Pharos tower, S. by W. ½ W., distant 8¼ cables; Eunostos light-house, S.W. ½ S. These bearings place Bittern shoal in approximately, lat. 31° 13′ 40″ N., long. 29° 53′ 10″ E.

Note.—This shoal lies about one mile S.E. of the 4½ fathoms patch reported in 1876. As it is possible that less water may exist, vessels should navigate in the vicinity with caution. *Variation*, 5½° *W.*

347.—Black Sea.—*Búg River.—Harbour Light off Fort Konstantine.*—Exhibited from a perch, painted red, and placed in 3 feet water at the extremity of the bar extending off fort Konstantine (Constantin), west bank of Búg (Boug) river. The light is *fixed red*, elevated 16 feet above the water, and visible from a distance of 4 miles. The channel between this light and the light on the east bank of the river is 370 yards wide, with a depth in mid-channel of about 5½ fathoms.

348.—Black Sea.—*Soujak Bay.—Penaï Point Light.—Alteration in Colour of Central Sector.*—On 15th August, 1882, the colour of the central sector of light (comprised between the bearings of N. 41½° E. and N. 59° E.) shown from Penaï point lighthouse would be altered from red to *green*—in consequence of the discovery of a shoal with 23 feet water over it, lying with the lighthouse bearing N. 49° E., distant 1¾ miles. *Variation*, ½° W.

349.—Africa.—*West Coast.—Cape Verde Islands.—St. Vincent Island.—Particulars of Bird Island Light.*—With reference to Notice 306, p. 713, on the exhibition of a light on Bird (Dos Passaros or Jow) island, entrance to Porto Grande, St. Vincent island, the light is *fixed white*, visible from the northward between the bearings of S. 32° W. and N. 81° W., and from the southward between N. 75° E. and S. 71° E.; elevated 306 feet above high water, and visible from a distance of about 14 miles. The light-house, 40 feet high, is circular in shape and constructed of iron. *Variation*, 20° *W.*

350.—Africa.—*East Coast.—Chuluwan Island.—New Light on*

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Chingani Point.—Exhibited from a lighthouse erected on Chingani point, northern extreme of Chuluwan (Chiluan) island. It is a *fixed white* light, elevated 39 feet above high water. The lighthouse, constructed of iron frame-work, stands on a pedestal of masonry. Position, lat. 20° 38′ 10″ S., long. 34° 53′ 30″ E.

351.—Bay of Bengal.—*Madras.—Precaution on approaching Madras Harbour.*—With reference to Notice in 1881 on regulations for the entry and departure of vessels using Madras harbour, further notice has been given that steam-vessels arriving at Madras should not approach the entrance to the harbour, but should wait for a pilot in not less water than 9½ fathoms. Mariners are cautioned on the necessity of observing this regulation, as in several instances, the pilot, on boarding steam-vessels that have approached the harbour entrance too closely, has been compelled to go full speed astern to avoid casualty.

352.—China Sea.—*Gulf of Siam.—Reported Sunken Rock North-Eastward of Koh Tau.*—Lying nearly in the centre of the gulf of Siam, about 85 miles north-eastward of Koh Tau. This rock, reported by the master of the Norwegian barque, *Koik*, is stated to be about 12 yards long in a north and south direction, with about 6 feet water over it. Position, as given, lat. 10° 50′ N., long. 101° 5′ E.

353.—China.—*East Coast.—Min River Approach.—Sunken Rock Southward of Changchi Island.*—Lying on the northern side of the channel between Changchi and Matsou islands, Min river approach. This rock (*Swallow rock*), on which the British barque *Sea Swallow*, drawing 18½ feet, struck at low water on 6th May, 1882, is stated to lie with the small islet on the S.E. side of Changchi island bearing about N.N.W., distant about 2 cables. Position approximate, lat. 26° 11′ 3″ N., long. 120° 2′ 0″ E. *Variation*, 1° *W.*

354.—China.—*Gulf of Pechili.—Miau-tau Islands.—Light on Houki Island.*—With reference to Notice in 1880 on the exhibition of a temporary light on Houki (Howki) island, Miau-tau islands, pending the completion of the lighthouse, the permanent light has been exhibited. It is a *flashing white* light, showing flashes at *half-minute* intervals, elevated 328 feet above the sea, and visible

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from a distance of 24 miles. The lighthouse, 46 feet high, constructed of stone and circular in shape, is painted black; buildings white. Position approximate, lat. 38° 3′ 45″ N., long. 120° 39′ 0″ E.

355. — AUSTRALIA. — *East Coast. — Inner Route. — Reported Sunken Danger South-Eastward of Dugdale Rock.*—Lying about one mile south-eastward of Dugdale Rock, Inner Route, between Capes Sidmouth and Direction. This danger, reported by Mr. Brookfield of the fishing vessel *Mary Lee*, is stated to be a coral knoll of small extent, with about 2 feet over it at low water spring tides. Position approximate, lat. 15° 2′ 20″ S., long. 143° 36′ 40″ E.

Note.—On the same authority it is stated that there is now not more than one foot at low water spring tides over Dugdale rock.

356. — SOUTH PACIFIC. — *Fiji Islands. — Viti Levu. — Suva Harbour.—Alterations in Na Mbukalou Light.*—With reference to Notice in 1881 the light (*green*), elevated 25 feet above high water, is now shown from a lantern painted white, on a pole placed close to high water mark, W. ¼ N. from its previous position; it is obscured southward of a line passing 50 yards north of the eastern-most of the two white buoys within the harbour entrance; also, obscured northward of a line passing 50 yards south of the black buoy marking Wai-Lami spit.

Note.—The church on the hill above Na Mbukalou has been removed. *Variation*, 9¾° *E.*

357.—UNITED STATES. — *California. — San Francisco.—Bell-Buoy to take the place of Temporary Light-Vessel off Entrance.*—With reference to Notice 288, p. 641, on and after September 30, 1882, the lightship moored near the wreck of the steamer *Escambia*, off the coast of California, near the entrance to San Francisco bay, will be withdrawn. In its place there will be moored, until the wreck is removed, an automatic bell-buoy, painted with red and black horizontal stripes.

358.—SOUTH AMERICA.—*Brazil.—Light on Cape St. Thomé.*—Exhibited from a lighthouse recently erected on Cape St. Thomé. The light exhibits *white* flashes *every minute* with total eclipses, elevated 157 feet above high water (148 feet above

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the ground), and visible from a distance of 19 miles. The lighthouse, in the shape of a truncated cone and of a red colour, is supported on iron columns; the keeper's dwelling, painted white, is in the lower part of the structure. Position approximate, lat. 22° 2′ S., long. 41° 0′ W.

359.—UNITED STATES.—*Mississippi.—Pass Christian Light.—Discontinued.*—On and after October 1, 1882, the fixed white light shown from a white tower at Pass Christian on the mainland, about 6½ miles N.W. of Cat island, Mississippi, will be discontinued.

360.—UNITED STATES.—*Maryland.—Potomac River.—Re-Exhibition of Upper Cedar Point Light.*—With reference to Notice in 1877, on the discontinuance of Upper Cedar point light, north bank of Potomac river, on 1st September, 1882 the light was re-exhibited. It is a *fixed white* light, elevated 34 feet above high water, and visible from a distance of 11 miles. The lighthouse is a screw-pile structure, square in shape and painted white; piles brown; lantern black.

361.—UNITED STATES.—*Maryland.—Lighthouse on Bloody Point Bar, Kent Island.*—On and after October 1, 1882, a *fixed red* light will be exhibited from the lighthouse recently constructed on Bloody point bar, Kent island, marking entrance into Eastern bay and St. Michael's river, Maryland. The apparatus lights 300° of the horizon, and the focal plane is 57 feet above mean low water. The light should be visible 13 miles. The structure is an iron tower, resting on a caisson filled with concrete, which stands in 8 feet of water at low tide. The tower is painted white; the lantern, red. Approximate position, lat. 38° 50′ 5″ N.; long., 76° 23′ 30″ W.

362.—UNITED STATES.—*Atlantic Coast.—Long Island Sound.—Dangerous Rock in Eastern Entrance to Fisher Island Sound.*—The position of the rock struck by the steamer *Massachusetts* in the channel at the eastern entrance to Fisher island sound has been examined with the following results:—The ledge shown on Coast Survey charts with 18 feet of water over it, consists of a cluster of rocks, the most dangerous of which is pointed, and has on it 13 feet; it lies about one-quarter of the distance from the bell

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buoy to red buoy No. 2, but to the westward of a line joining them, and is on the following bearings: Watch Hill lighthouse, N.N.E. $\frac{7}{8}$ E., distant about 855 yards; red buoy No. 2, N.E. by E. $\frac{1}{4}$ E., distant 345 yards; bell buoy, S., distant 220 yards; Watch Hill Reef spindle, S.W. $\frac{1}{2}$ S., distant 845 yards. To avoid the ledge keep close to the bell buoy or favour the side of the red buoy.

363.—United States.—*Maine.*—*Whitehead Lighthouse.*—*Alteration in Fog-Signal.*—The fog-signal at Whitehead lighthouse, western side of Muscle Ridge channel, now gives a blast of *four seconds'* duration, followed by an interval of *twenty-six seconds.*

Charts, &c., Published by the Hydrographic Department, Admiralty, in July and August, 1882.

No.		s.	d.
277	Newfoundland, east coast:—How harbour ...	0	6
282	Newfoundland, north-east coast:—Ste Geneviève bay to Orange bay and strait of Belleisle ...	2	6
466	West Indies, Haïti:—Gonaïves bay	1	0
61	Japan:—Tsurugu bay. Mikuni roads. Miyadsu harbour and port Ine	1	6
436	India, west coast:—Bánkot and entrance to Mhar or Sávitri river	1	6
2897	Gulf of Mexico:—Tampa Bay	1	6
414	West Indies, Cuba:—Havana harbour	2	6
627	Africa, west coast:—St. Paul de Loando to Great Fish bay. (Plans: Lobito bay. Benguela bay. Equimina bay. Elephant bay. St. Mary bay. Espiègle bay. Little Fish bay. Port Alexander)	2	6
876	China sea, Tong King gulf:—Haïnan strait. (Plan Inner passage)	3	0
1008	Cochin China:—Davaich head to Hone Gomme, including Cam-rahn, Nhatrang, Binkang, and Hon-cohe bays	1	6
2689	North America, west coast:—Haro and Rosario straits	2	6

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No.		s.	d.
2040	England, south coast:—The Solent, Hurst point to Cowes and Southampton water	2	6

CHARTS THAT HAVE RECEIVED IMPORTANT CORRECTIONS.

No.

2249 Malta:—Valetta to Marsa Scirocco.
2593 North sea:—Ameland to Jade river including Ems river.
2882 United States:—Gloucester harbour.
1491 England, east coast:—Harwich harbour.
2431 North America, west coast:—Port Simpson to Cross sound.
1809 Africa, east coast:—Mozambique to Pomba bay.
2031 Ceylon, east coast:—Caratievoe to Pedro point.
2871 United States:—Boston harbour.
2000 Prince Edward island:—Crapaud road.
2337 North America, west coast:—Sitka sound.
942*a*. *b*. Eastern Archipelago.
825 Bay of Bengal:—Andaman isles.
1377 Sandwich islands:—Hanalai, Kairua bays, &c.
1 British islands to Mediterranean sea.
87 Spain, west coast:—Cape Finisterre to cape St. Vincent.
2891 Gulf of Mexico:—Timballier, Vermilion bays, &c.
2728 Spain:—Bayonne to Oporto.
1019 China sea, Hainan island:—Yu-lin-kan bay, &c.
652 Africa, east coast:—Mozambique harbour.
1607 England, east coast:—North Foreland to the Nore.
1982*a*, *b*, *c*, South America, east coast:—Parana river.
2444, 2445, South America, east coast:—Sketch of river Paraguay from Corrientes to Asuncion.

HYDROGRAPHIC NOTICES RECENTLY PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, 1882.

No. 28.—AUSTRALIA DIRECTORY, vol. III. Relating to Turtle Dove shoal, Pelsart bank, and Clio breakers.

No. 24.—CHINA SEA DIRECTORY, vol. II. Relating to certain shoals in Tong King gulf.

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Books.

	s.	d.
Africa Pilot, part 1. Supplement No. 1. Bight of Benin and gulf of Guinea	0	6
Australia Directory, vol. 2, Supplement No. 1. Torres strait	0	6
St. Lawrence Pilot, vol. 1, comprising sailing directions for the gulf and river. 5th edition, with an appendix, 1882	3	6
Sailing directions for the Dardanelles, Sea of Marmara, and the Bosporus, 3rd edition, 1882	8	0
Admiralty catalogue of charts, plans, and sailing directions, 1882	1	0

OUR OFFICIAL LOG.

Official Inquiries at Home, 1882.

1446. *Lady of the Lake*, barque; built at Dundee, 1861; tonnage, 307; Liverpool to Maranham; railway material; lost near Lanceos Grandes, June 30, 1882. Inquiry held at Liverpool, August 14, 1882, before Mansfield, Judge; French and Murdoch, N.A. Accident caused by master attempting a dangerous passage at night instead of lying-to for daylight. Certificate not dealt with.

1447. *Alice*, s.s.; built at North Shields, 1876; owned by Mr. A. Wilkinson; tonnage, 11; Tyne to Amble; passengers; stranded off Amble, June 29, 1882, when loss of life ensued. Inquiry held at North Shields, August 11, 1882, before Spence and Baker, Justices; Aplin, Curling, and Parish, N.A. Master in default for navigating too close to land. Certificate suspended for three months.

1449. *Tyne*, schooner; built at Arbroath, 1834; owned by Mr. J. Ross; tonnage, 60; abandoned 14 miles from Whitby, July 16, 1882. Inquiry held at Leith, August 17, 1882, before Pringle and Wilson, Justices; Ward and Grant, N.A. Abandonment premature. Master and owner in default, No order as to costs.

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1450. *Ardeer*, s.s., and *Brothers*, schooner; the former built at Paisley, 1871; owned by Mr. E. Wadham; tonnage, 141; Barrow to Bowling; pig iron; the latter built at Ulverstone, 1849; owned by Mr. W. Postlethwaite; tonnage, 70; pig iron; in collision off Walney Island, July 19, 1882, when the schooner foundered with all hands. Inquiry held at Liverpool, August 17, 1882, before Mansfield, Judge; Powell, Beasley, and Methven, N.A. Collision due to the schooner improperly starboarding her helm and endeavouring to cross the steamer's bows.

1453. *Bride*, three-masted schooner; built at Prince Edward's Island, 1872; owned by Mr. H. Hoskins; tonnage, 427; Swansea to Valparaiso; coal; abandoned off Cape Horn, May 1, 1882. Inquiry held at Swansea, August 21, 1882, before Fowler, Judge; Vaux and Davies, N.A. Abandonment justifiable.

1455. *City of Edinburgh*, s.s.; built at Glasgow, 1876; tonnage, 2,090; Calcutta to London; rape seed, jute, &c., and three passengers; stranded on a bank off Saddle Hill, Coast of Arabia, June 19, 1882. Inquiry held at Glasgow, August 24, 1882, before Hannan and McLean, Justices; Comyn and Moresby, N.A. Master in default for improper and unseamanlike navigation and for neglect of the lead.

1458. *Toronto*, barque; built at Quebec, 1872; owned by Mr. W. Thomas; tonnage, 785; Birkenhead to Valparaiso; coals; lost off Cape Horn, December 20, 1881. Inquiry held at Liverpool, August 26, 1882, before Mansfield, Judge; Forster and Knox, N.A. No evidence before Court as to cause of loss.

1464. *Clara*, barque; built at Sunderland, 1853; owned by Mr. P. Stuart and another; tonnage, 623; Opŏbo River to United Kingdom; palm oil; lost on Eastern Spit, Opŏbo River, June 23, 1882. Inquiry held at Liverpool, August 30, 1882, before Raffles, Judge; Wilson and Murdoch, N.A. Accident caused by want of sufficient power in the steam-tug to tow the vessel against wind and current. Master exonerated from blame.

1465. *Minna*, s.s.; built at Govan. 1865; owned by City of Cork Steam Packet Company; tonnage, 505; Cork to Liverpool; passengers, cattle and general cargo; stranded on Penrhos Point,

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Anglesea, August 9, 1882. Inquiry held at Liverpool, September 1, 1882, before Raffles, Judge; French and Kennedy, N.A. Accident due to vessel having been carried out of her course by ebb tide in a dense fog. No material damage done.

1466. *Druid*, s.s.; built at Middlesborough, 1866; owned by Mr. J. Chapman; tonnage, 695; Bilbao to Rotterdam; iron ore; lost near Bilbao, July 19, 1882. Inquiry held at Sunderland, September 1, 1882, before Ritson and Potts, Judges; Ward and Comyn, N.A. Master in default. Admonished to be more careful in future.

1471. *Dartmore*, s.s., and *Ardeer*, s.s.; the former built at Stockton, 1881; owned by Dartmore Steamship Company; tonnage, 1,038; Sulina to Glasgow; maize; the latter built at Paisley, 1871; owned by Mr. W. Wadham and others; tonnage, 141; in collision in Glasgow Harbour, August 14, 1882. Inquiry held at Liverpool, September 6, 1882; before Raffles, Judge; Parish and Hyde, N.A. Collision caused by error on part of master of *Ardeer* in leaving telegraph at "half speed ahead" instead of "full speed astern." Certificate not dealt with.

1473. *Valhalla*, s.s.; *May Fly*, yacht; the former built at Hartlepool, 1877; owned by Mr. F. Herskind; tonnage, 1,420; the Tyne to Genoa; coals; the latter built at East Cowes, 1882; owned by Mr. G. W. H. Warder; tonnage, 77; on a yachting cruise. In collision off Dungeness, July 22, 1882, when loss of life ensued. Inquiry held at Middlesbro', September 5, 1882, before Coleman, Judge; Beasley, Pickard and Vaux, N.A. Chief officer of *Valhalla* in default for keeping a bad look-out. Certificate suspended for one year.

1474. *Camargo*, s.s.; built at Sunderland, 1880; owned by Mr. R. W. Jones and others; tonnage, 607; Newport (Mon.) to Bilbao; coals; stranded on coast of Spain, July 30, 1882. Inquiry held at Cardiff, September 2, 1882, before Paine and McConnochie, Judges; Curling and Davies, N.A. Master in default for careless navigation. Certificate suspended for three months. Second officer severely censured.

1476. *Hermes*, ship; built at Port Glasgow, 1881; owned by Mr. R. R. Paterson and others; tonnage, 1,392; Greenock to

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San Francisco; coal, fire bricks, &c.; supposed to have foundered at sea, not having been heard of since December 4, 1881. Inquiry held at Greenock, September 8, 1882, before Neill and Blackmore, Justices; Castle and Aplin, N.A. No evidence as to cause of loss. Vessel left on her voyage in good and seaworthy condition and not overladen.

1477. *Newnham*, s.s.; built at Jarrow, 1880; owned by Mr. J. Temperley, Junior; tonnage, 1,296; Bombay to Genoa, and Marseilles; general cargo; stranded on Shab-Ali Reefs, Red Sea, November 18, 1881. Inquiry held at North Shields, September 7, 1882, before Spence and Swan, Justices; Harland and Methven, N.A. Master guilty of careless navigation. Certificate suspended for six months. Chief officer also in default for not verifying ship's position. Severely censured.

Official Inquiries Abroad, 1882.

1445. *Agnes*, schooner; lost at Plettenberg's Bay, May 28, 1882. Inquiry held at Knysna, June 3, 1882. Loss due to vessel being placed in a foul berth by the master.

1448. *Star of Brunswick*, ship; lost on Bull Point, Falkland Islands, May 31, 1882. Inquiry held at Stanley, June 22, 1882. No blame attached to master.

1451. *Ludwig*, schooner; lost in Algoa Bay, June 26, 1882. Inquiry held at Port Elizabeth, July 1, 1882. Accident due to defective ground tackle.

1452. *Holyrood*, s.s.; foundered at sea on a voyage to Saigon. Inquiry held at Singapore, June 27, 1882. Loss caused by vessel being overladen.

1454. *Cashmere*, barque; grounded on a sand bank in the harbour, Newcastle, N.S.W., May 16, 1882. Inquiry held at Newcastle, June 30, 1882. Pilot and master of tug to blame. Reprimanded.

1456. *Clyde*, s.s., and *E. and U. Cameron*, schooner; in collision in the Wanganui River, June 17, 1882, when both vessels took the ground. Inquiry held at Wanganui, June 17, 1882. Master of steamer to blame for using no precaution whilst passing the

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schooner, and master of that vessel in default in having no anchor watch on deck.

1457. *Telegraph*, schooner; stranded at Roumea, June 17, 1882. Naval Court held June 21, 1882. Master to blame for not anchoring when night came on, and for neglecting the lead. Reprimanded.

1459. *Borrowdale*, s.s.; lost on Rabbit Island, in the Archipelago, June 18, 1882. Naval Court held at Constantinople, July 24, 1882. Loss caused by gross negligence and incapacity on part of master. Certificate suspended for twelve months.

1460. *Magnet*, schooner; lost on Island of Tanna, New Hebrides, May 17, 1882. Inquiry held at Sydney, June 19, 1882. Drifted ashore in a calm. Master free from blame.

1461. *Rocket*, s.s.; lost in Macleay River, May 28, 1882. Inquiry held at Sydney, June 19, 1882. Loss caused by a warp fouling the screw.

1462. *Llewellyn*, s.s.; lost on Belambi Reef, May 23, 1882. Inquiry held at Sydney, June 6, 1882. Master in default in navigating his vessel too close in shore. Certificate suspended for three months.

1463. *Arawata*, s.s., and *Sea Nymph*, brig; in collision in Sydney Harbour, June 8, 1882, when the brig foundered. Inquiry held at Sydney, June 21, 1882. Master of steamer to blame in endeavouring to move his ship on such a dark and dirty night. Reprimanded.

1467. *Socotra*, s.s.; lost at entrance of Moulmein River, May, 1882. Inquiry held at Moulmein, June 15, 1882. Master in default for omitting to make allowance for current. Certificate suspended for 6 months.

1468. *Mohusser*, barque; lost on Saugor Sands, May 1, 1882. Inquiry held at Calcutta, May 31, 1882. Pilot in charge to blame.

1469. *Gipsy Chief*; lost in the China Sea. Inquiry held at Macao, March 21, 1882. Loss due to master's ignorance of his true position and of the currents prevalent.

1470. *J. E. Fisher*, barkentine; lost. Naval Court held at Macao, March 9, 1882. Master guilty of error of judgment.

1472. *Carleton*, schooner; stranded on Bird Rock Reef,

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Bahamas, July 7, 1882. Inquiry held at New Providence, July 21, 1882. Accident caused by vessel being set to the eastward by strong current.

1475. *Fleurs Castle*, s.s.; lost near Ras Assir, July 9, 1882. Inquiry held at Aden, August 8, 1882. Master guilty of reckless navigation. Certificate suspended for nine months.

MARINE INVENTIONS.

Monthly List of Patents—Compiled for this Journal by Messrs. W. P. Thompson and Boult, British and International Patent and Trademark Agents and Consulting Engineers, 323, *High Holborn, London, W.C.; and Berridge Street, Leicester; also by Messrs. W. P. Thompson & Co.*, 6, *Lord Street, Liverpool.*

ENGLISH (PATENTS).

3951. Samuel Sealy Allin, of Woodstock Road, Bedford Park, Middlesex. "Improvements in water motors and in utilising the force of rivers and streams for the purpose of generating electricity, and in the means employed therefor."

3953. Henry Christian Hobnitz, of Renfrew, North Britain, partly a communication from H. Hirsent, of Paris, France. "Improvements in dredging machinery."

3988. James Edward Hunter, of Lower Belgrave Street. Eaton Square, and John Holdsworth Thomas, of Barque Street, Cubitt Town, Middlesex. "Improvements in the construction and arrangement of apparatus for raising sunken vessels and other submerged bodies."

4008. W. K. Lake. A communication from M. Fernberg, of Nassjo, Sweden. "An improved apparatus for indicating the position of sunken ships or other objects."

4022. Samuel Searle Hazeland, of St. Sampson's, Cornwall. "Improvements in the construction of rowlocks for ships and other boats, and in oars to be used therewith."

4027. E. P. Alexander. A communication from Mathias

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Neuhaus, of Berlin, Germany. "Improvements in dredging and in emptying dredging lighters, and in the apparatus employed therein."

4104. Louis William Jelf, of the Naval and Military Club, Piccadilly, Middlesex. "Improvements in portable folding or collapsible boats."

4119. George Fellows Harrington, of Northwood House, Ryde, Isle of Wight. "Improvements in propelling ships or vessels."

4143. Ernest Easthope, of Wolverhampton. "Improvements in and relating to diving apparatus and apparatus for enabling persons to breathe freely in a vitiated atmosphere, such improvements being applicable in the case of diving bells, and in part also to apparatus for supplying purified gas under pressure for other purposes."

4167. Charles Mace and John Brewster, both of Sunderland. "An improved instantaneous boat-disengaging apparatus."

4169. Percy M. Crause, of 27, Upperton Gardens, Eastbourne. "Improvements in paddle-wheels."

4173. C. A. Abel. A communication from Emmanuel Lavarenne, of Paris, France. "Improvements in the construction of ships or vessels, and in apparatus in connection therewith for utilising the resistance of displacement."

4199. Walter Robert Kinipple, of Greenock, Renfrew, N.B., and of 2, Westminster Chambers, Middlesex. "Improvements in the construction of hopper and other dredgers."

4210. A. M. Clark,. A communication from Henry Cordes, of Hoboken, Hudson, New Jersey, U.S.A. "Improved means of discharging bilge water from the holds of vessels."

4213. A. M. Clark. A communication from J. W. Brown and J. W. Brown, junior, both of Baltimore, Maryland, U.S.A. "Improvements in apparatus for loading and unloading vessels."

4221. William Pepper, of Kingston-upon-Hull, York. "Improvements in apparatus for steering vessels, applicable also to other purposes."

4243. William Rowden, of Whitstable, Kent, and Charles Edward Doughty, of Margate. "Improvements in sprit sails especially applicable to sea-going barges."

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4325. Francis John Croft, of Birkenhead. "Improvements in and relating to screw-propellers for ships and other navigable vessels."

4374. Thaddeus Hyatt, of 21, Addison Gardens, N. Kensington, London, Middlesex. "Improvements in ships, with reference primarily to safety and secondarily with reference to speed and reduction of cost, and in apparatus and means, modes and process connected therewith."

PATENTS PUBLISHED.

5647. W. P. Thompson. A communication from George Augustus Cochrane, of Montreal, Canada, and of New York, United States of America. "Improvements in the construction of steamships and other vessels for conveying fruit and other perishable organic matter, parts of which improvements are applicable to storerooms and wagons." These improvements consist in perforating all the decks below the main-deck with numerous holes, the freight being so stowed as to allow a free circulation of air in a vertical direction from ventilators on the upper or main-deck to the bottom of the hold. A space is arranged in the hold a foot or two in depth, which is partially filled and partially vacant, with any absorbent of the gases of decomposition such as charcoal, lime, or even soil. The sides of the vessel and the bulkheads are formed, more especially the one separating the engine-room from the after-hold, with one or more thoroughly ventilated air jackets, forming one or more non-conducting bulkheads of air, with an inlet and outlet ventilator to each, thus shutting off the heat of the engine-room from the cargo. When the outer air is sultry, cold dry air is taken, cooled by compression and subsequent expansion, and passed through the cargo to the lower hold, and out through the exit ventilator. By this means the cargo is kept dry, as well as cool, and the sweating and spoiling of the fruit or other perishable matter avoided. This system of vertical ventilation may also be employed in buildings, store-rooms and wagons for storing or carrying perishable organic matter, and the ventilated air jackets to the shutting off of the heating action of the sun's rays or other

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sources of heat. This apparatus can be used to keep the cargo warm, instead of cold, if desired.

251. Robert Pickwell, of Kingston-upon-Hull, in the county of York, Civil Engineer. "Improvements in recording instruments chiefly for use on board ship." Dated January 18, 1882. 6d. This invention has for its object the application of the mariner's compass or magnetic needle to the purpose of automatically making a diagram or register, showing the course of the vessel. It is obvious that its application is alike available for aerial navigation, caravans, railways, and in fact to any moving body. The register of the course of a vessel from the time of leaving one port to the arrival at her port of destination can be kept, the action being automatic, it records the course or changes that have been made during the whole voyage, and forms a valuable check upon captains and officers in charge, and should any casualty to the vessel at sea occur the bearing of her head would be shown at the time when such occurred, and the conflicting evidence of officers and men would be in a great measure rendered needless and obviated. The method by which this registering record is brought into practice is to employ stationary or moving strips of paper conveniently placed on a travelling strip, or band may be used if preferred, and actuated by clockwork so that the compass needle may trace a diagram which indicates the bearing of the ship's head during the whole voyage. This diagram may be marked upon the paper by one of the methods usually employed for taking indicator diagrams with a pencil point or needle or by aid of photography or electricity. Clockwork is employed to move the strips and so represent the uniform motion per hour of the lines traced on the diagram. The compass is so arranged that it can be seen and checked with ordinary compass as to adjustment and truth, and the instrument is arranged so that the officer in charge may have access to the diagrams or not as may be desirable during voyage and the ship's course daily laid down on the chart and the diagrams be filed and certified if desired.

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GENERAL.

IRRAWADDY RIVER—BIRMA.

THE following remarks on the passage of H.M.S. *Ready* from Rangoon to Thayetmyo and back are derived from a report made by Commander H. H. Edwards, 1881.

Routes.—To reach the main river from Rangoon, there are two routes converging at Yandoon, one through Pan y Can creek, the other by way of Bassein creek and China Bâkir river.

Of these routes that by Pan y Can creek is recommended when ascending the river, as it is 67 miles shorter than the other and carries 6 feet more water; the creek is, however, narrow and intricate, and at the point of junction with the main stream the navigation is so difficult that none but steam-vessels fitted either with twin-screws or large additional rudders could turn. The Pan y Can creek is not used by steam-vessels when descending the river on account of the difficulties and frequent accidents incidental to this point.

The route by China Bâkir river and Bassein creek is that used by large steam-vessels on their downward trip, being much less obstructed than Pan y Can creek, and having almost always a sufficient depth of water for vessels drawing not more than 6 feet, at high water neaps.

A vessel drawing more than 6 feet can only be certain of getting through Bassein creek at spring tides.

The *Ready*, drawing 9 ft. 9 in., passed through Bassein creek on the flood one day before spring tides; for a distance of several miles there was not more than her own draught of water, but the mud was so soft that the vessel never brought up, though steaming as slowly as possible, through the shallower parts.

It is said that by carefully judging the time of entering this creek a depth of 12 feet may be carried through, but the difficulty of so judging renders vessels of more than 10 feet draught liable to be detained.

There are two other routes from seaward up the Irrawaddy

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river, namely, that leading through Bassein river and Thamadine creek, and that through the entrance to the Irrawaddy proper, which enters the sea at a few miles west of Krishna shoal.

Of these routes, Thamadine creek which is always used by the river steam-vessels, is narrow and intricate, but has a depth of 3 fathoms, it joins the main stream at a little below Henzadah, about 120 miles above Rangoon.

The Irrawaddy proper is said to be the straightest and best channel to the sea, having a depth of 12 feet on the bar at low-water springs; it is, however, seldom used, as there is no town at the entrance.

Pilots.—The frequent fluctuations of the river can only be followed by the constant observation of local pilots, who are each qualified for districts about 60 miles long.

Current.—The average current experienced when above tidal influence was 3 knots an hour, but at some points it attained a velocity of between 5 and 6 knots.

Rise of River.—In 1877 the river is reported to have risen 9 feet above the mean high level, that being the highest rise recorded. The rise varies irregularly, being sometimes greater at Prome than at Thayetmyo, 50 miles above; but generally it decreases below Prome and increases above that place.

At Thayetmyo the river bank is, as a rule, so steep that vessels can lie sufficiently near to admit of hauling a boat to and fro by a line; care, however, should be taken lest the copper be rubbed by snags, projecting from the bank at a few feet below the water.

Shaikh Othman, near Aden.—The village of Shaikh Othman, situated about six miles beyond the isthmus line of works, and commanding all the roads leading to Aden, has been purchased from the Sultan of Láhej by the Indian Government for, it is said, $50,000. The village possesses some copious wells, whence the garrison and shipping at Aden obtain large supplies of excellent water. The place was twice-captured by the British; first, in 1841, when an attempt was made by the combined Abdaly and Fudhly tribes to recapture Aden; and, secondly, in 1858, in consequence of several outrages on British subjects committed by the Abdaly,

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under the Sultan of Láhej, on which occasion the fort was blown up, with the ammunition found stored there. Since that time there has been no interruption in the friendly relations between the Abdaly and the British, and its free sale to us is a proof of the good understanding which exists between the two parties. The following notice of the purchase appears in a recent number of the *Sanaâ*, an Arabic paper published in the town of that name:—"The English have purchased Shaikh Othmân and the land appertaining thereto on the coast of the Sea of Omân, to the eastward of Aden, and have commenced forming a town there by locating some of the Aden inhabitants in the newly-acquired territory."

PORT OF MONTREAL, CANADA.—Comparative statement showing the Dates of the Opening and Closing of Navigation, the first arrival from sea and the last departure for sea, during the past ten years:—

YEAR.	Opening of Navigation.	Closing of Navigation.	First Arrival from Sea.	Last Departure for Sea.
1872 ...	May 1 ...	Dec. 8 ...	May 5 ...	Nov. 28
1873 ...	April 25 ...	Nov. 26 ...	,, 4 ...	,, 21
1874 ...	,, 25 ...	Dec. 18 ...	,, 11 ...	,, 21
1875 ...	May 8 ...	Nov. 29 ...	,, 9 ...	,, 22
1876 ...	April 27 ...	Dec. 10 ...	,, 8 ...	,, 23
1877 ...	,, 17 ...	Jan. 2 (1878)	April 29 ...	,, 24
1878 ...	March 30 ...	Dec. 23 ...	,, 20 ...	,, 24
1879 ...	April 24 ...	,, 19 ...	May 1 ...	,, 24
1880 ...	,, 17 ...	,, 3 ...	,, 2 ...	,, 22
1881 ...	,, 21 ...	Jan. 2 (1882)	April 29 ...	,, 23

WE REGRET to have to record the sudden death of Mr. J. D. Potter, of 31, Poultry, the oldest publisher of the *Nautical Magazine*. Mr. Potter's amiable disposition and business capacity will make his loss much felt. The Admiralty Chart Agency will, no doubt, continue to be carried on by Mr. Potter's son, at 31, Poultry.

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THE

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OUR CONSULAR RELATIONS WITH THE UNITED STATES.

THE evils and inconveniences arising from the absence of any Consular Convention between this country and the United States with respect to the discipline of the crews of British merchant ships in American ports, as yet show no signs of diminution. Indeed the tendency has of late been rather in the opposite direction. With the return of more prosperous times on the other side of the Atlantic, and the consequent rise in the rate of wages, desertions have grown more frequent, and the difficulties experienced by shipmasters in the management of their crews have increased instead of becoming less. The Consul at Savannah, in his report for 1880, drew attention to the fact that numerous complaints were still being lodged at his consulate with regard to this particular evil, and this, not only in the case of his own, but with respect to all the ports of the United States. Out of 574 men engaged, discharged, and deserted, on and from British ships at Savannah in that year, no less than 250 were deserters. And the Consul points out that the pecuniary loss entailed on owners by these frequent desertions does not comprise the whole of the evil. There is also a great relaxation of discipline, as the substitutes who are picked up to fill the places of the deserters

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have usually received an advance almost equal to the whole amount of their wages for the homeward voyage, and the result is they are quite careless whether their conduct on board gives satisfaction or not. The same Consul in his report for last year states that out of 754 men registered for British ships at his consulate, 289 were deserters.

And at New Orleans matters are equally bad. The Consul gives the following figures as illustrating the prevalence of the evil at that port:—

Year.	Total Number of Crews.	Discharges.	Desertions.
1871	4,606	283	1,110
1872	3,850	196	986
1873	6,739	297	951
1874	6,579	298	612
1875	4,934	307	770
1876	5,095	333	593
1877	4,407	144	456
1878	7,272	135	460
1879	7,222	210	580
1880	9,605	303	1,159
1881	7,958	252	1,041

He states that the wholesale desertions which take place at New Orleans are the result of a combination among the boarding-house keepers and certain shipping masters, who (at the time the Consul wrote) had agreed to fix the rate of advance at one month's wages for steamers and six weeks for sailing ships. For the purpose of having the advances spent at their establishments the boarding-house keepers send their runners on board vessels newly arrived, and "literally take the crews" out of them. Nor will they allow a man to re-ship until they give their consent and fix the amount of the advance he is to demand. He is allowed to have no control whatever over the advance. The note is taken from him as he leaves the consulate and discounted by his guardians upon their own terms. In order to carry out malpractices of this kind more effectively men are often sent to sign agreements, and accept advances, who are not intended to

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proceed on the voyage, and frequently these dummy substitutes are not seamen at all. And then at the last moment the spaces thus left vacant have to be filled by men "picked up anyhow and anywhere."

These facts tend to show that discipline at New Orleans, so far as the crews of British ships are concerned, is practically at an end. And there is good reason to believe that the evidence we have quoted affords no more than a fair illustration of what takes place at other ports in the States. The New Orleans Consul, however, does not trace the evil entirely to the present defective condition of the law upon the subject. He endeavours to throw a considerable portion of the responsibility upon the shoulders of British shipmasters. He points out that, in the case of his own port, the State law of Louisiana already provides heavy penalties for the offences of inducing seamen to desert and of harbouring deserters, but that masters are either too supine or too timid to institute proceedings. As an instance of this he quotes the following case which occurred under his cognizance :—"On the 14th January a man presented himself at this consulate for shipment on board the barque *Sofia de Vila*, and gave as his last ship the barque *St. Olives*. I found that his name was still on the articles of the latter ship, and asked if he had left her. He said he had, and a runner standing by his side added, 'Yes, I took him out of her yesterday.' I said, 'Do I understand you to mean that you took him out of that ship as a deserter from her and to enable him to desert?' And the reply was a straightforward 'Yes.' I then sent for the master of the *St. Olives*, read the law to him, and advised him, as the case was such a clear one, to see his agents, confer with other masters, and combine to enforce the penalty as a precedent. I offered my own services to conduct the case, and guaranteed that the legal expenses should not exceed 50 dollars. The reply (through the agent) was: 'Acting on your suggestion regarding the desertion of seamen from British ships, our captains and ourselves have done what we could in the matter to stop this hardship, but they all decline, fearing the expense and notoriety.'"

British shipmasters have often taxed the Consuls with a want

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of zeal and energy in taking measures to prevent desertion, and it is not surprising that the Consuls in their turn should endeavour to throw the responsibility back, especially when cases like the one just mentioned come under their notice. And in fact there is reason to believe that masters are not altogether blameless in the matter. When difficulties are experienced with crews there is naturally a strong inclination to act as may seem best for the moment, and without much regard for distant consequences. A master's chief anxiety consists in the desire to get his ship to sea with a minimum amount of present trouble and inconvenience, and he rarely thinks of sacrificing his own immediate advantage for the more doubtful future benefit of others, by involving himself in a serious quarrel with the combined boarding-house and crimping interests of the port. The instance quoted by the New Orleans Consul is by no means the only one of its kind. If similar evidence of the partial responsibility of masters for the existence of the evils of which they so frequently complain were required, it might readily be found But the truth is, it is useless to look for the suppression of desertion by the mere enactment of regulations against crimping. Even if the present State law of Louisiana on this subject were general throughout all the States, it would be practically inoperative —unless, indeed, the local police took vigorous measures on their own account for its enforcement. And this contingency is one upon which it would be a sheer waste of time to speculate.

The only practical remedy for desertion of the kind practised from British ships in American ports is the power to arrest deserters and convey them on board, and until this power is conferred by a definite international arrangement, the root of the evil must remain untouched. Doubtless there are occasional cases like that mentioned by the Consul at New Orleans, in which masters might take effective measures against crimps, but as a rule the issue would be too doubtful, and the delay of the ship too long and expensive to allow of legal proceedings being undertaken. It can hardly be expected that shipowners will sacrifice themselves with a view to the possible suppression of American crimping

There is reason to believe that the English Government are

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fully alive to the necessity for dealing with the question. In August, 1881, Mr. Ashley stated in the House of Commons that the Foreign Office were taking initial steps with a view to the establishment of a Consular Convention, but we regret to say that, as yet, no definite results have been made known. The matter would seem to be one which ought to be surrounded by no very serious difficulty. It may be assumed that the United States Government are fully prepared to enter into a general arrangement upon the subject. They have made Conventions with all other maritime nations of any importance, and it is not likely that they can have any object in making an exception in the case of England. The difficulty is to understand by what cause the settlement of the question can have been so long deferred. The English law affords every facility for concluding a Convention. The Foreign Seamen (Deserters) Act of 1852, empowers the Government of this country to make reciprocal arrangements with other nations by Orders in Council for dealing with deserters, while the Merchant Shipping Act of 1876 and the Merchant Seamen Act of 1880 make provision for extending any of the provisions of the various British Merchant Shipping Acts to foreign seamen in this country. The Act of 1880 refers in this respect chiefly to crimping, but the Act of 1876 seems sufficiently comprehensive for all purposes. By section 37 of that statute it is provided that, whenever a foreign State desires to have, "any of the provisions of the Merchant Shipping Acts, 1854 to 1876, or of any Act hereafter to be passed amending the same," applied to its vessels, Her Majesty may, by Order in Council, make such provisions apply "in the same manner in all respects as if such ships were British ships."

Of course the scope of any Convention that may now be made will be limited by the provisions of the Merchant Seamen Act of 1880. Imprisonment for desertion being abolished in this country in the case of British ships, it cannot remain in force for deserters from foreign vessels, and the power to arrest and convey on board is all that we could now either offer to, or ask from, a foreign Government. But we have no doubt that this would be sufficient to put a strong check upon the wholesale system of desertion which now prevails in American ports.

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At the same time, however, it must be borne in mind that there is a serious phase of the question which will remain unaffected by a Convention dealing simply with desertion. In the case of the United States something more is requisite than the mere power to arrest deserters and convey them on board. At present it frequently happens that the American Courts of Law assume the power to set on one side contracts made in this country. Trumpery charges are brought by deserters against their late masters, and the local tribunal before which such cases are investigated often takes upon itself to regard the articles of agreement entered into here as worthless and invalid. This is an intolerable evil, and it is difficult to see how any Convention which omits to deal with it can work satisfactorily. The Merchant Shipping Act of 1880, gives the deserter in this country a right of appeal to a court of law, and if a similar provision were extended to the United States under a Consular Convention, it would lend itself directly to the perpetuation of this particular evil. Unless, therefore, some arrangement were made both for preventing the commencement of vexatious and groundless actions, and for upholding lawful agreements made in this country, the deserter would still be master of the situation in a large number of cases.

It is to be hoped that no unnecessary delay will be allowed to take place with regard to the settlement of this question. There is something altogether anomalous in the fact that our relations with America should have remained so long unregulated by any mutual agreement. There is, perhaps, no country with which our maritime communications are so constant and extensive as with the United States, and yet nothing has thus far been done to provide for a satisfactory settlement of the questions which are almost every day arising with respect to the discipline of the crews of our merchant ships in American ports. All is left in a haphazard state of confusion, and the American crimp is about the only man who is not justified in deprecating a change of any kind. It behoves the English Government to spare no effort in striving to bring about a speedy reformation, and it is to be hoped that no long period will elapse before they will have some definite announcement to make on the matter.

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AMERICAN TONNAGE.

THE advocates of the retention of the Moorsom system of tonnage in the inquiry upon the subject by last year's Royal Commission, found one valuable argument in the fact that that system is fast becoming an international one. The part of the English rules which regulates the allowance for steamers is, as we have frequently shown, open to grave objections, and yet all foreign Governments which have adopted English gross tonnage have with one notable exception, accepted the principle of an allowance for the machinery space in steamers. The one exception, was the United States, the first foreign nation to adopt the Moorsom tonnage, so far as actual measurement was concerned.

What we have to say on the subject, may be made plainer by our first quoting the summary of the English rule for engine-room allowance, as given in papers put in as evidence before the Royal Commission, by Mr. Thomas Gray, Assistant-Secretary, Marine Department, Board of Trade :—

"Screw steamers, 32 per cent. of the gross tonnage of the ship, in case the tonnage of the actual or nett engine-room is between 13 and 20 per cent. of such gross tonnage, and in the case of actual engine-rooms of above and under such limits, the allowance is $1\frac{3}{4}$ the tonnage of the actual engine-room.

"Paddle steamers, 37 per cent. of the gross tonnage of the ship in the case of actual engine-rooms, between 20 and 30 per cent. of such gross tonnage, and above and under such limits, the allowance is $1\frac{1}{2}$ the tonnage of the actual engine-room."

The Suez Canal tonnage rules admit of an allowance in respect of propelling power at the option of the owner, in either of the following ways :—

1. Total space occupied by machinery, boilers, and fixed bunker space.

2. Once and three-quarters the actual machinery space in screw steamers, and once and a-half in paddle steamers.

The allowance in both rules is limited to 50 per cent. of the gross tonnage.

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Of the various nations which have adopted the Moorsom system of tonnage measurement, most have chosen one or other of the Suez rules for allowance for propelling power.

Austro-Hungary, Germany, Italy, Norway, Russia and Belgium use the first Suez rule; Denmark, Spain, Holland, and Greece use the second Suez rule; and all of them limit the allowance to 50 per cent. Sweden first used the English rule, but has recently altered it for the second Suez rule. France uses the English rule of allowance, but with a maximum limit of 40 per cent.; and Finland uses a modification of the English rule. It may be remarked that the first Suez rule originated with the English proposed Merchant Shipping Code of 1870, and that several European powers adopted it with the idea that it would sooner or later be the legalised English rule. The Royal Commission on Tonnage of last year recommended that the shipowner should be allowed the option of the two Suez rules, the allowance being, however, limited to 33 per cent. in screw steamers and 50 per cent. in paddle steamers. Although it may be said that the rule giving as allowance the total space occupied by boilers, machinery, and fuel, would be a just and fair one as between various classes of steamers, there is one practical difficulty in carrying it out in practice which would unfit for application too many English ships. An owner is required by it, in submitting his vessel for measurement, to point out the fixed bunker space, and when that is measured and deducted from the tonnage, he must not use it for any other purpose than that for which it is allowed. To restrict the use of bunker holds to carriage of fuel on homeward voyages would often entail great loss upon the shipowner, and might when they were empty and other parts of the ship had large quantities of heavy cargo, be the cause of such a distribution of weight as compared with buoyancy as would lead to the ship being subjected to severe straining.

Having thus briefly stated the courses adopted by England and by the various European nations and by the Suez Canal Tonnage Commission,* in reference to allowance from tonnage for

* Tonnage for payment of dues at the mouths of the Danube is estimated in the same way as Suez Canal tonnage.

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propelling power, it remains to be noticed that the United States Government, which was the first to follow England in the Moorsom system of measurement, were alone in the course they took with regard to steamers. The English law of tonnage came into operation in 1855, the United States adopted it in 1865, so far as regards gross tonnage, but they then decided to make no allowance whatever to steamers, and although a bill was introduced into Congress in 1872, it did not become law.

This year, however, Congress has passed a law, from which we quote the clause regulating the allowance in respect of crew space and machinery spaces.

"That from the gross tonnage of every vessel of the United States there shall be deducted the tonnage of the spaces or compartments, occupied by or appropriated to the use of the crew of the vessel, but the deduction for crew space shall not, in any case, exceed five per centum of the gross tonnage. And in every such vessel propelled by steam or other power requiring engine-room, there shall also be deducted from the gross tonnage of the space or spaces actually occupied by or required to be inclosed for the proper working of the boilers and machinery, including the shaft trunk or alley in screw steamers, with the addition in the case of vessels propelled by paddle-wheels of fifty per centum, and in the case of vessels propelled by screws of seventy-five per centum of the tonnage of such space, but in no case shall the deductions from the gross tonnage exceed fifty per centum of such tonnage; and the proper deductions from the gross tonnage having been made, the remainder shall be deemed the net or register tonnage of such vessels.

We take the action of the United States Government to be a practical answer to attempts which have been made during the last few years to disturb the existing international system of tonnage. So far from there being any tendency on the part of other nations to introduce any other than the Moorsom system, here is a proof that the benefit of a fairly good and uniform tonnage is so much appreciated that foreign Governments not only accept entirely the main principles of our tonnage laws, but are willing to follow the recommendations of the Commission on tonnage even before our own Government has found itself able to do so.

One of the dissentient Commissioners, Mr. Rothery, very ably argued the case of displacement tonnage pure and simple with no

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allowances. To cut off all allowances is certainly an easy way of settling the whole question, and yet the United States Government, having tried the simple and easy way for the last seventeen years, have now come to the conclusion that practically the allowance system is the most equitable.

It must not be supposed that their decision is influenced by any possible gain in the way of dues paid to other nations. It has been the system in England to allow United States steamers the same allowances as our own. Their gross measurement has been accepted, and the English Board of Trade Surveyor merely measures the machinery spaces and computes their allowance in accordance with the English law. In the United States, English ships have hitherto paid dues on their gross tonnage.

In America, up to the present time, there has been no allowance made for the spaces occupied by the crew, but it will be seen by the new law that in future there is to be such an allowance, with a limit, however, of five per cent. of the gross tonnage. All other European nations have a similar limit, but in English tonnage at present there is no limit whatever to the allowance for crew space. From what one sees in English ports it can hardly be expected that the crew will gain very much by the new law, American ships being at present favourably distinguished for the excellence of their accommodation. It may be that in the smaller classes of American vessels the crew space deduction may do as much good in the way of securing proper accommodation as it has done in many English vessels, and would do in more if its provisions were made compulsory in all vessels. One improvement however, might be made in the crew spaces clauses of the English tonnage law, in order to secure its benefits to the very small vessels employed in the coasting trade, in many of which even now the quarters of the crew are often places in which no decent man would put his dog. In these vessels, the master and crew would, if they had the choice, prefer to be berthed all together in the after part of the vessel, where they might all be made comfortable, and, if in such cases the space so jointly occupied were allowed as crew space, on condition of its being properly fitted up, the owners and crews of the vessels would prefer the arrangement to the existing state of things.

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On the whole question of tonnage we believe that if some few defects in detail, which we have pointed out in this and former articles be amended, the Moorsom system of tonnage will hold its own successfully, at least for many years to come, against any of its rivals. One great argument in its favour is its practical success as an international tonnage.

REPORT ON ADMIRALTY SURVEYS FOR THE YEAR 1881.

By Captain Sir Frederick J. O. Evans, R.N., K.C.B., F.R.S.

THE following ships of war have been employed during the year 1881 on surveying duties on foreign stations:—

Steam-vessels:—Alert, east coast of Australia, Torres Strait, Arafura Sea. *Fawn*, Red Sea; Shoal banks in Indian Ocean, Delagoa Bay. *Flying Fish*, north-east coast of Borneo, Tsugar Strait in Japan, also west coast of Yezo and east coast of Nipon. *Magpie*, Hainan Island; Shoal banks; Sea.

Sailing Vessels:—Alacrity, Fiji Islands. *Sparrowhawk*, West Indies. *Lark*, built for surveying service in Western Pacific Ocean; left England in June, arriving at Sydney in October.

In addition to the foregoing, the hired steam-vessel *Gulnare* has been employed on the coasts of Newfoundland, and the sailing schooner *Meda* on the shores of Western Australia. The expenses of the *Meda* are borne jointly by the Home and Colonial Governments.

Two vessels have been engaged on surveying duties on the coast of the United Kingdom; the paddle-wheel steam-vessel *Porcupine* belonging to the Royal Navy, with a hired crew; and the small paddle-wheel steam-vessel *Knight Errant* hired especially for this service.

The number of officers of all ranks employed in the several vessels herein referred to, amounts to 79, and their crews to 555.

Coasts of the United Kingdom.—Staff-Captain Parsons and his surveying party in the *Porcupine* were engaged in the early part

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of the season on the east coast; closely re-sounding the Scroby and Corton sands fronting Yarmouth; these extensive shoals, with their several navigable channels, being subject to change, especially after winter gales.

In continuation of the work executed in 1879 and 1880, the months of July and August were occupied in extending the sectional lines of soundings in the English Channel and its approaches; the western of these lines reached a position 85 miles seaward of Ushant, and included a bank several miles in extent shoaler by some 21 fathoms than the neighbouring waters, which average 77 fathoms. As this comparatively shoal ground had not hitherto appeared on the charts, it has received the name of Parsons Bank.

To complete the more recent surveys of Spithead and its approaches, the Horse, Dean, and Motherbank shoals have been re-sounded; their last examination having been made in 1848.

At Harwich Harbour a re-survey was made of the entrance, at the request of the Board of Trade, in order to determine the movement of the shoals in the neighbourhood of Landguard Point, as resulting from modern engineering works.

Staff-Commander Tizard and his surveying party in the *Knight Errant* have been chiefly employed in the Irish Channel and on the east and south coasts of Ireland.

Ramsay Harbour and Port Erin, Isle of Man; Dundalk Bay and Harbour; the bar and approaches to Wexford Harbour; Waterford Harbour and bar; with the Queen's Channel, have severally been re-sounded, to meet either changes by time or local improvements.

Sectional lines of soundings, south of Ireland, in continuation of those made in 1879 (*see* report for that year) reaching to the parallel of Ushant, and extending westward to the meridian of 9° W., were made in the midsummer months with the same special attention to accuracy of detail.

Passing into the Bristol Channel, the Scarweather and North shoals were closely re-sounded, and marked changes in the configuration of their seaward ends detected, necessitating a re-adjustment of their buoyage.

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Staff-Commander Jarrad was detached in the summer to make a detailed survey of the whole tidal area of Wexford Harbour; this was completed from the entrance as far up the Slaney River as the drawbridge above the town.

An examination was also made of a part of Wexford South Bay in order to define the position of the shoal ground known as "Holden's" Bed, which had shifted considerably from its earlier charted position.

This officer further completed a large scale plan of Wicklow Harbour, showing the harbour works in course of construction; and a re-survey of Wicklow roadstead.

West Coast of Africa.—Consequent on the request, combined with the offer of assistance of the British and African Steam Navigation Company, for a more complete survey of the bars and mouths of the oil rivers in the Bights of Benin and Biafra, Lieutenant Field was despatched on this service in October. With the co-operation of Her Majesty's cruizers *Foam* and *Pioneer* in the neighbourhood, and the small light draft branch steamers placed at his disposal from time to time, this officer, by unremitting zeal, succeeded in charting in full detail the Nun entrance of the great Niger River, locally known as Akassa, also the mouths of the rivers New Calabar, Opobo, and the Portuguese and Man of War channels of the Bonny. The sounding work was completed by the close of the year, and before the well-known "smokes" of this region had set in.

Lieutenant Field, in his reports, acknowledges the hearty co-operation he received from Sub-lieutenants Fawckner and Coxon of the *Foam*, and from Captain J. Gillies, the agent of the company preferring the request for the surveys.

West Indies.—Lieutenant White, with his small party in the sailing schooner *Sparrowhawk*, having completed a detailed survey of the Grand Cayman Island; as also an examination of the western part of the extensive Pedro Bank, south of Jamaica; proceeded in the fall of the year to Nassau, New Providence; and thence, to complete the survey of the Little Bahama Bank, originally commenced in Her Majesty's ships *Thunder* and *Lark* so far back as 1836-46.

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Fair progress has been made on the part situated between the Elbow Cay Lighthouse and Pensacola Cay.

Newfoundland.—The survey of the deeply indented shores of Newfoundland has made steady progress during the year under Staff-Commander Maxwell in the hired steam vessel *Gulnare*. Following up the work of former years the outer coast of Notre Dame Bay, terminating eastward at Toulinguet Island has been completed; Hall Bay to the westward has also been completed in full detail.

On the western coast, the survey of the spacious Bay of Islands with its deep arms, in continuation of the survey of last year, has been completed in full detail.

China.—Lieutenant and Commander Carpenter and Staff, leaving England in January, relieved Captain Napier and party in the *Magpie*, and the vessel having been thoroughly refitted at Hong Kong, work was commenced in South China in May.

Captain Napier's excellent survey of the eastern entrance to Hainan Strait, referred to in the Report for 1880, was continued to the westward and completed with the same attention to detail. This somewhat important, and certainly useful highway, is now in course of being completely charted.

In continuation from Hainan Strait, the west coast of Hainan, which was found to be several miles out in position, was connected by running survey with the south coast of the island, as charted by the well-known Daniel Ross of the Indian Marine in 1802, and this charted part again connected by running survey with the eastern entrance to Hainan Strait.

Lieutenant Carpenter considers that the entire coasts of Hainan are now in relative position, and that its salient points are well delineated. He describes the island as volcanic in character, many of the mountain peaks retaining their crater form; some of them attain heights exceeding 5,000 feet; they are steep and apparently inaccessible. The plains are cultivated with sugar and maize.

Included in the useful work performed during the year in the *Magpie* was a fairly full examination of the Macclesfield Bank, its boundaries for the first time being determined. The features of this extensive bank of soundings, 75 miles in length by 37 miles in

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breadth, are remarkable; the whole may be described as a submerged atoll reef; on this reef or rim of the bank, the average depths are about 10 or 11 fathoms, with almost perpendicular sides seaward; these sides fall from 20 to 600 fathoms in some parts, and then descend to 1,800 fathoms, the average depth of the floor of the surrounding ocean; within the rim the depths range from 30 to 55 fathoms. The examination carried out in the *Magpie* failed in finding depths under 9 fathoms; although 4¼ fathoms on the northern edge is recorded on good authority.

Borneo.—Japan.—Early in January the *Flying Fish*, under Lieutenant and Commander Hoskyn, commenced an examination of the north-east coast of Borneo, which extended to the middle of April. Lieutenant Hoskyn confined his survey principally to the channel used by the trading steamers when running along the coast between Mallawalle Island (near the north extreme of Borneo) and Sandakan Harbour. In charting this route, especially during the thick and hazy weather which accompanies the north-east monsoon, much close examination was required to find passages worthy of the name of channels through the labyrinth of reefs that extend nearly the whole distance.

Lieutenant Hoskyn remarks that the trade on the coast has lately much increased and probably will continue to do so as the country becomes opened up, but that, owing to the difficulties of the coast navigation, the whole seaboard being fringed with coral reefs, the traffic must be carried on, as at present, either in native boats or small steam-vessels. The rivers from which the principal produce at present comes appears to be the Kinabatangan, the Luikabo in Lubuk Bay, and the large rivers which empty themselves into the upper part of Sandakan Harbour.

Much difficulty was experienced in obtaining the correct names of places. The inaccuracy of many of those published on the coast of Borneo has been frequently noticed; this arises in part from certain places being known under different names to the various tribes who frequent the coast. As regards the north-east coast, it has been so swept in past years by the Sulu pirates that now they are the only people who have any real knowledge of the coast. Through the friendly offices of Mr. Pryen, the agent of the

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North Borneo Company at Sandakan, Lieutenant Hoskyn obtained the services of an old Sulu pirate and also of a Sandakan native; the names that will appear on the coast survey are dependent mainly on their information.

Proceeding to Japan, after refit at Hong Kong, Lieutenant Hoskyn embraced the opportunity, when in the vicinity of Omai Saki at the entrance to Suruga Gulf, to search for the Oleander Rock (a danger on which the British barque of that name, drawing 14 feet, was reported to have struck in August, 1880), but without success: the fishermen in the neighbourhood assert that no such danger exists.

During the summer months the *Flying Fish* was engaged in Tsugar strait, that part of the strait eastward of a line joining Hakodadi and Toriwi-saki has been completed in detail, and the dangers off Siriya-saki and Toriwi-Saki, over which so much doubt has existed, are now properly charted.

Of the reported dangers, Charybdis Rock could not be found; the lighthouse-keeper and fishermen state that the Rattler Rock is the outermost danger off Siriya-saki.

The western coast of Yezo from Cape Rodgers to Cape Ota has been surveyed in connection with the western entrance of Tsugar Strait, embracing the off-lying Islands of Okosiri, O-sima, and Ko-sima. This work was carried out with difficulty, owing to fine weather being rare, the wind blowing alternately with strength from south-east and south-west, with intervals of calm, foggy weather.

During the occasional visits of the ship to Hakodadi, the harbour was resounded.

The *Flying Fish* left Hakodadi in the middle of October, her commander intending to employ the remainder of the year 1881, in Van Diemen Strait.

East Coast of Australia.—Torres Strait.—Arafura Sea.—The *Alert*, under Captain Maclear, after being docked, and undergoing a complete refit at Sydney, occupying three months, left that port in the middle of April; the first service being the measurement of meridian distances, in continuation of the work of former surveyors, to Port Curtis, the Percy Islands, and Port Molle.

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Detailed surveys were made of the last-named port, as also of the passage between Molle Islands and the main land; this passage being frequented by the local steam-vessels passing to and from Port Denison.

Proceeding along the inner route to Torres Strait, and contributing on the voyage to the hydrography of this remarkable ocean highway, Thursday Island, in Torres Strait, was reached early in June. Making the small settlement on this island a central station, an exhaustive survey was carried out of Prince of Wales channel, and of its eastern and western approaches, extending from Double Island on the east, to the meridian of 141°, 52′ east longitude on the west, including an examination of the boundaries of the Larpent and Gerard Banks, and the sounding out the neighbourhood of Booby Island.

In this exhaustive survey, which will be of great benefit to the rapidly-increasing navigation through Torres Strait, as being the direct route, various reported dangers have been cleared from the charts, one or two discovered, and the positions of others accurately determined.

The small settlement at Thursday Island, where there is a resident magistrate, is useful as a coal depôt; and much business is transacted in supplying stores to the small fleet engaged in the pearl fisheries in Torres Strait, and in forwarding their produce; there is an average call of a steam-vessel once a week. At the time of the visit of the *Alert*, the fishery then engaged at Warrior Reef gave employment to 130 vessels, and about 1000 men. The imports in 1880 were valued at £15,218, and the exports at £52,275, of which £47,664 was for pearl shell, and £2,808 for bêche de mer.

Before quitting this neighbourhood the *Alert* was fortunately enabled to render assistance to the Italian transport ship of war *Europa*, which had accidently grounded near the Thursday Island settlement.

On leaving Torres Strait for Port Darwin, in the early part of October, several lines of soundings, transverse to the track taken by shipping, were made; until Cape Wessel on the western side of the Gulf of Carpentaria was reached. The longitude of this

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salient point was verified by sea observations, as being correctly charted.

After rating chronometers at Port Darwin, the *Alert*, in November, proceeded to Singapore, before the westerly monsoon had set in with strength; passing Timor and Wetta Islands, and thence by way of Sapodie, Banca, and Rhio Strait, amendments to the charts being effected on the voyage.

Western Australia.—Staff-Commander Archdeacon, in the *Meda*, surveying schooner, has been engaged on the north-west coast in making elaborate plans of Beagle Bay and Port Walcott (Tien-Tsin), continuing the survey from the latter place towards Legendre Island. The continued ill-health of the *Meda's* crew obliged the vessel to proceed to the southward for change of climate at an earlier date than was contemplated.

Proceeding inshore, the geographical positions of Cape Preston, North-west Cape, and the entrance of the Gascoyne River were amended, and a sketch survey of the mouth of the Gascoyne and the anchorage off it, executed.

Western Pacific Ocean.—Lieutenant G. E. Richards, in succession to Lieutenant Moore, continued in the *Alacrity* the survey of the Fiji Group.

This officer informs me that he has completed the south and south-west coasts of Vanua Levu from meridian of 179° east to 178° 15′ east; including Yadua Island, and the north-east coast of Viti Levu from 178° 15′ to 178° 35′ east, together with the intermediate islets and reefs.

Red Sea.—Indian Ocean.—East Coast of Africa.—Captain Wharton, in the *Fawn*, having completed the survey of the Sea of Marmara, as mentioned in the report of last year, the ship was refitted at Malta, and recommissioned by Commander Aldrich. The first work for 1881 was undertaken in the Red Sea, during the cooler months of the year, and was continued from February to the early part of June.

During this time a detailed survey of the Hanish Islands was commenced, and although the work was occasionally retarded by the strong southerly winds prevalent in the lower part of the Red Sea at this time of the year, the eastern side of the group was nearly completed.

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Leaving Aden towards the end of June, the *Fawn* commenced in July, sounding over the Saya de Malha Bank, and favoured by three weeks of fair weather, was enabled to chart a large part of the main features. It has long been considered a reproach to hydrography that so little was known of this extensive area of shoal water; well authenticated accounts existed of $6\frac{3}{4}$ and 7 fathoms having been found on the bank; also reports of as little as four fathoms. Commander R. Moresby, of the Indian Navy, commenced its examination in 1837-8, but his surveys, preserved in the Admiralty, do not indicate less than 9 fathoms.

Furnished with Moresby's soundings, Commander Aldrich was enabled to take up new ground, and succeeded in defining the boundaries of the bank to the depth of 100 fathoms, as also to chart much shoal water; the smallest depth obtained in the *Fawn* being 5 fathoms.

The Saya de Malha Bank, the limits of which are comprised between the parallels of 8° 15′ south and 11° 45′ south, and between the meridians of 59° 35′ east and 62° 20′ east, is formed of two main banks; the North bank, about 80 miles long and greatest breadth 25 miles, has a shoal ridge that extends nearly the whole length, chiefly on its eastern side, the least depth found (5 fathoms) is in latitude 9° 13′ south: the South Bank assumes a somewhat circular shape; its area is much greater than the North Bank with shoal ground on its northern and eastern sides, on which the least depth found in the *Fawn* was 11 fathoms, and by Moresby 8 fathoms.

After refit and recruit of the crew at Mauritius, the *Fawn* proceeded to Delagoa Bay, and executed some useful work in sounding between the Shefeen Beacon and Elephant Island, defining the edges of the Shefeen and Lech Reefs.

From Delagoa Bay the ship in October proceeded to resume her surveying operations in the Red Sea, calling at Inhambane, Mozambique, and Zanzibar on the passage.

As notified in my report of last year, much useful addition to hydrography is received from time to time, from nearly all the maritime states of the world; many of which have government departments dealing specially with hydrography, similar to the

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Hydrographic Department of the Admiralty. Between these departments and our own (and the same holds good as regards India and the Colonies) there exists a free interchange of charts and other documents bearing on coast navigation and harbour pilotage.

In the remark-books kept in Her Majesty's ships, and from the periodical returns furnished by the navigating officers of Her Majesty's ships, valuable hydrographic information, bearing either on the revision of, or as additions to Admiralty charts and sailing directions, are now almost daily received at the Admiralty.

Of these reports may be mentioned one of a visit to Diego Garcia, in the Chagos Archipelago, made in Her Majesty's ship *Eclipse*, Captain Garforth, in the interests of steam navigation between this country and Australia; also in relation to the Eastern Archipelago much useful information has been contributed by the officers of Her Majesty's ship *Egeria*, particularly on the north-east coast of Borneo; and arising from a recent visit to the north-west coast of Africa, in Her Majesty's ship *Espiègle*, an interesting report has been received from Captain Bridge of that ship, on Cape Juby (at present a trading station of the North-West African Company), as also of the remarkable estuary of the Ouro River, some 300 miles further to the southward.

Captain Bridge bears testimony to the fidelity of the charts of these regions, executed by Admiralty surveyors 60 years ago.

Among contributions from the Mercantile Marine, may be noticed some useful remarks made during a voyage to the Sea of Okhotsk and the shores of Kamchatka, by Mr. A. Ponsonby, commanding the steamship *Cleveland;* as also several useful lines of soundings, obtained in the neighbourhood of Tampico, and of Vera Cruz, in the Gulf of Mexico; by the steamships *Dacia* and *International*, belonging to the India Rubber, Gutta Percha, and Telegraph Works Company.

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THE AMERICAN PASSENGERS' ACT OF 1882.

AN Act to regulate the carriage of passengers by sea has recently been passed by the United States Congress, and as it affects not merely vessels sailing under the American flag, or even ships taking passengers from American ports, but also vessels bringing other than cabin passengers from other countries across the sea to the United States, we propose to give an abstract of it, at the same time comparing its more important provisions with those of the English law.

1. Section 1 of the Act thus provides for the space allotted to each passenger:—"In a steamship, the compartments or spaces unobstructed by cargo, stores, or goods, shall be of sufficient dimensions to allow for each and every passenger carried or brought therein 100 cubic feet, if the compartment or space is located on the main-deck or on the first deck next below the main-deck of the vessel, and 120 cubic feet for each passenger if the space is located on the second deck below the main-deck of the vessel; and it shall not be lawful to carry or bring passengers on any deck other than the two decks above mentioned."

The English law provides for 15 square feet of deck space on the upper passenger deck, and 18 on the lower, except that when the lower 'tween-decks is less than 7 feet in height, 25 square feet must be allowed.

Thus it will be seen that a vessel which has passed the English law and has 7 feet height between decks would not offend against the new American law, since 15 square feet deck area would give 105 cubic feet of space, a margin which would in most cases provide for the difference between the definition of an adult passenger in the laws of the two countries to be referred to later on. Ships of other countries, however, will be affected by it, the laws of some European nations only requiring about 60 cubic feet for each passenger.

Sailing ships under the new American law may only carry passengers on the deck next below the main-deck of the vessel, or

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in a poop or deck-house, and each passenger must have 110 cubic feet of space.

All passenger spaces must have a height from deck to deck not less than 6 feet. In computing the number, children under one year are not included, two children between 1 year and 8 years are counted as one passenger.

In the English law two persons between the ages of one and *twelve* are counted as one statute adult passenger.

It remains to be said that a violation of this section by the master is a misdemeanour, that he is to be fined 50 dollars for each passenger in excess of the proper number, and is liable to six months' imprisonment.

Section 2 provides for the proper berthing of the passengers. There may not be more than two tiers of berths, the berths must be properly constructed and partitioned, each being at least 2 feet wide and 6 feet long, the interval between the lowest berth and the deck must not be less than 6 inches, and that between the two tiers as well as that between the top tier and the deck above not less than 2 feet 6 inches. Each berth must not be occupied by more than one passenger over 8 years old, but double berths of 4 feet wide may be provided, each of which may be occupied by two women, by one woman and two children, by a husband and wife, by a man and two of his own children, or by two men personally acquainted with each other. All the male passengers not berthed with their wives must be in a separate compartment forward bulkheaded off, and unmarried females must be berthed in a compartment bulkheaded off, the opening into any adjoining passenger space being so constructed that it can be closed and secured. Families, however, are not to be separated except with their consent. Each berth is to be numbered serially, and the berths may not be removed until they are inspected, or until after 12 hours from the time of entry at an American port. For any violation of these provisions, the master is liable to a fine of five dollars for each passenger carried by the vessel.

In some respects, this clause falls below, in others it is in excess of, the corresponding requirements of the English law. The regulation as to tiers and intervals is exactly the same, but the

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widths of berths may be 1 ft. 6 ins. by the English law; the English law, however, forbids two men being placed in the same berth, and does not absolutely require a separate compartment for single men, if the berths are enclosed in separate rooms, in which case one room must be allotted to the single men. There is no provision in the English law for the separate berthing of single women, nor for the serial numbering of berths. As a matter of fact, however, there is usually in English emigrant vessels a separate compartment appropriated to the single women. Further, under the English law, the separation of families is so far compulsory, that single males above the age of twelve years must be in either a separate compartment, or a separate room, whether they form part of families on board, or not. We may remark that any compulsory increase in the size of berths would be a very doubtful gain to steerage passengers, since by its operation, the sleeping space would take up more room, and the total remaining the same, there would be less room in the place for sitting and taking meals.

Section 3 contains provisions regarding ventilation and sanitary arrangements. Every compartment containing fifty or more passengers must have a ventilator at each end of it, the ventilators being not less than twelve inches in diameter, and standing six feet above the uppermost deck of the vessel. This provision, however, will not concern English passenger steamers, for if ventilating arrangements have been passed by the emigration officers at the sailing port, it will be deemed to be sufficient. Every vessel must have booby hatches for the passengers, and the coaming forming the sill of the booby hatch must be at least six inches high. There must also be proper ladders with handrails or ropes at each hatchway. There must also be cooking apparatus sufficient for the number carried. Water-closet accommodation must also be provided, at least two, and one additional for every 100 male, or 50 female passengers, the latter being for the exclusive use of women and children. The water-closets must be kept and maintained serviceable and clean, must be properly separated from passenger compartments and must *be located on each side of the vessel.* This last clause contains a

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restriction which is unknown to the English law or to the practice of the English Emigration Officers, who approve water-closets, if right in other respects, irrespective of their being either at the *sides* of the vessel or amidships. The number of water-closets required is the same as in the English law. The penalty for any violation or neglect in respect of section 3 is a penalty not exceeding 250 dollars.

Section 4 provides for victualling. Each passenger is to have an allowance of good and proper food, three meals a day at regular hours, the quantity to be regulated, the rations for each passenger being equal in value to one and a-half Navy rations of the United States. Four quarts of fresh water are to be furnished daily to each passenger, and if any are put on short allowance either of food or water, except in case of accidents necessitating such a course, each passenger is to receive 3 dollars per day for the period. Fresh or condensed milk is also to be furnished as may be necessary for young children and infants, and tables and seats must be provided. Every wilful violation of this section is a misdemeanour and involves a fine not exceeding 500 dollars and imprisonment of the master for a term not exceeding six months. It is also provided that enforcement of this penalty does not affect civil liability to the passengers for injury caused by negligence or default.

The scale of provisions is fixed in detail by the English Passengers' Act, but the Board of Trade have power to sanction an alternative scale which may, in their opinion, furnish as much wholesome nutriment. We are not aware what the Navy ration scale of the United States may be, and hence are unable to make any comparison, but we believe it to be the case that in English emigrant ships the victualling is generally in excess of the statutory requirements. The English law requires three quarts of water per day for each statute adult, exclusive of water used in cooking.

Section 5 refers to hospitals for passengers. They must not be below the deck next below the main-deck, must if contiguous to passenger spaces be properly divided off from them, and must contain not less deck area than in the proportion of 18 clear

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superficial feet to every 50 passengers, and must be properly supplied with beds, bedding, &c. Every ship having over 50 passengers, other than cabin passengers, must carry a surgeon who must have proper instruments. There must also in this case be a proper stock of medicines and medical comforts for passengers, and such food and nourishment as is necessary for young children, and the services of the surgeon must be available for anyone needing them. Violation of either of the provisions of this section renders the master liable for a penalty not exceeding 250 dollars. The corresponding provisions of the English law are identical with those of this section.

Section 6 provides for discipline and cleanliness. Regulations are to be made and posted by the master to maintain them. The master is to cause the passenger compartments to be kept clean, and as often as necessary disinfected. Passengers and their bedding are to be mustered on deck in fine weather, and a clear and sufficient space on the main or any upper deck of the vessel is to be set apart for them for exercise. The penalty for non-observance of this is one not exceeding 250 dollars. In addition to this, the English law prescribes the area of space which must be set apart for the steerage passengers for exercise: it must not be less than five square feet for every statute adult carried.

Section 7 provides against intrusion of the crew into passenger space. No officer and none of the crew may visit or frequent that space except by direction or permission of the master, under penalty of a fine not exceeding 100 dollars and imprisonment not exceeding 20 days for each offence, and if the master gives such direction or permission, except for some necessary purpose, he is liable to a fine of the same amount. A copy of this section, written or printed in the language or principal languages of the passengers, must be by order of the master posted in the forecastle and in each of the passenger spaces, the default involving misdemeanour and a penalty not exceeding 100 dollars.

This section is worthy of the special attention of masters of passenger vessels; there are not penalties for any such offences under the English law.

Section 8 provides against carriage of dangerous goods or cattle.

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No explosives other than those required for ship's use, and no article or articles which as either cargo or ballast may in any way be likely to endanger life or health or the safety of the vessel may be carried. Animals may not be carried below a passenger deck nor in the same compartment with passengers, nor in any adjoining compartment except in an iron ship having watertight bulkheads extending to the upper deck. For every violation of this section the master is guilty of misdemeanour, is liable to a fine of 1,000 dollars and a year's imprisonment.

The English law covers section 8, and in, addition, has provisions limiting the number of cattle in proportion to the tonnage of the ship and absolutely limiting it to 10 head of cattle or 40 sheep. It also prescribes detailed regulations as to clear space being left on the weather-deck, prohibits absolutely the carriage of pigs or male goats, and limits the number of dogs conveyed as cargo to six.

Section 9 provides for landing the passengers. Except in case of distress, no one, other than the pilot, agents of the vessel, consuls, and Government officers may leave the vessel till she is in charge of a Customs' officer, and no one may leave then till all the passengers and their baggage are landed. A passenger list is to be delivered to the officer of Customs who first boards the vessel, and this list is to include all passengers (those in the cabin specified separately) and the number of pieces of baggage belonging to each passenger. The name, age, sex, calling, and nationality of each passenger is to be stated, and in the case of emigrant passengers the location of the space occupied by each. Particulars of deaths on the voyage must also be stated, and the list, verified by oath of the master, delivered to the Collector of Customs on entry of vessel. Penalty in this section, 1,000 dollars.

Section 10 provides that for every passenger above eight years of age who has died on the voyage by natural disease, the master or consignees must pay ten dollars to the Customs within 48 hours after arrival, or 24 hours after entry of the vessel, and in default may be compelled to pay 50 dollars in addition in each case.

Section 11 empowers the Customs' officers to measure the

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passenger space, and report otherwise upon the vessel. They are to measure each compartment or space occupied by other than cabin passengers in the same manner as ships are measured for tonnage, to compare in each case the number occupying with the measurement of the space occupied, and to report generally upon the manner in which the provisions of the Act appear to have been carried out.

The American tonnage law being, as regards methods of measurement, practically identical with the English tonnage law, it is easy to see on what principles the passenger spaces will be measured and their cubic content computed. Spaces between decks are measured thus:—The length is measured at the middle of the height, and is divided into an even number of parts varying with the size of the vessel at each point of division of the length, and also at the ends a breadth is measured. The breadths are measured in each case at the middle of the height. The height taken for computation is the mean height between decks. The computation is by Simpson's Rule of Ordinates thus applied:—Multiply the second and all the even breadths by 4, the third and all the odd breadths except the first and last by 2. To the sum of all these products add the first and last breadth, multiply this sum by one-third of the interval of length between the points at which the breadths are taken. Multiply this product by the mean height, and the result is the content of the space in cubic feet. The number by which the length is divided, and the corresponding number of breadths taken should vary, as the space is more or less curved so as to secure sufficiently accurate results. Passenger space by the English law depends upon area of deck.

Section 12 extends the application of the law to vessels taking passengers from ports in the United States to foreign countries not contiguous to the States, and from Atlantic to Pacific ports, and *vice versâ*, applying in the latter case when part of the route is overland through Mexico or central America. Section 13 provides that fines shall be liens upon the vessel, and Section 14, and last, repeals some former statutes, and fixes the operation of the Act to commence at 90 days from the date of passing.

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CRIMPING.

SINCE the Payment of Wages and Rating Act of 1880 was passed, a greater number of cases of crimping at British ports appear to have been prosecuted. A few remarks on this subject will therefore be probably acceptable to our readers. It will be found on reference to the Merchant Shipping Act of 1854, that certain sections are specially designed to correct this evil. Without mentioning all, we may allude to four:—First, the 147th, which aims at suppressing the illegal supplying of seamen to outward-bound ships. Second, the 237th, which deals with the practice of boarding inward-bound vessels for the purpose of enticing crews on shore. Third, the 255th, against false descriptions of loafers passed off as *bona fide* sailors. Fourth, the 257th (which is probably the most important), for punishing those crimps who persuade seamen to break their contracts, and harbour them afterwards. In order to punish offenders it has always been found difficult to get the requisite amount of evidence. The cases have to be taken into a criminal court where the strictest rules of evidence are enforced, the *onus probandi* resting strictly on the prosecutor. Frequently seamen deserters had to be brought from prison to give their testimony. Now that help is gone, since the passing of the Act of 1880, imprisonment for desertion is practically abolished. The roundabout way of enforcing the Employers' and Workmen's Act of 1875 is so absurd, as applied to the *nomadic* seamen, that, after some few attempts, shipowners appear to have given up the task in despair. The consequence is that desertion and neglecting to proceed after signing agreements have doubled or trebled in two years' time. Where desertion is, crimping must be. The one is an index of the other. It does not follow that all deserters are known as such to boarding-house keepers, but it is probable that they are pretty strongly suspected in the great majority of cases. The Act says that the harbourer is liable "if he knows or *has reason to*

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believe" that the seaman is a deserter. Hence, if it can be proved that a boarding-house keeper "has reason to believe," as stated, he can be convicted as a crimp. The prosecutions to which we have referred have mostly been taken at the Welsh coal ports. Whether that is owing to the greater prevalence of the practice there, or to the superior vigilance of the officers, we are quite unable to judge. The disease has assumed somewhat new phases. Last month (October), a case or two occurred at Newport. One familiar crimp, at least one recognised by the bench as having often been fined there, and who had paid in large sums, was convicted under section 5 of the Act of 1880. That section by the way amends the section (237th) above quoted. He had boarded a steamer illegally on arrival, and without permission of the master. He pretended that he was a carpenter looking for a job. Another man was fined for harbouring a seaman who failed to join his ship. The said seaman had signed articles at Newport to proceed to Cardiff to join the vessel there. He refused to go. His "boarding master" very properly declined to "harbour" him, and another, less scrupulous, took him in. The seaman himself gave evidence, as well as the master of the ship, the vessel being still in port. The crimp was convicted. The seaman, of course, went scot-free, because of the state of the law. In one case a crimp was fined an accumulated penalty of £38 for "persuading" to desert. At Cardiff one peculiar case was that of a person, who was represented to be the Secretary of the Boarding-House Keepers' Protection Society (which afterwards proved to be a false representation). He had "attempted" to prevent a carpenter from joining ship because the carpenter had signed for £4 per month, or £2 per month less than he (the crimp) considered was the right thing to do. The carpenter was a German and so was the master (vessel being British), and both were quite content with the terms agreed upon. The vessel, however, had gone to sea, and by considerable ingenuity as to identification, the crimp was convicted. Under such circumstances, it is, as may be supposed, most difficult to carry such cases through successfully. It is clear from the evidence at the last-mentioned case that the crimps are banded together at Cardiff. They will,

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like their secretary, attempt to fix the rate of wages after the New York fashion. Things will go from bad to worse, unless vigorously checked. The remedy is not far to seek. It may be said that the seaman must be dealt with in the same manner as his fellow workman on shore. Well, if it comes to that, why not do so? The Acts of 1875 are twofold. There is a Conspiracy Act hanging over the head of the workman on shore. Not so with the seaman. It is necessary to make them both alike, is it? Then do so. But in doing so, let common sense prevail. Let all the circumstances of the case be well weighed. It is not, perhaps, necessary to go back to the "hard lines" of the Act of 1854; but a few simple penalties should suffice. Drunken "neer-do-weel" sailors wilfully neglect to join. *Vide* the Newport case. Why should such men not be placed in the same category as the crimp who was convicted for his sake? If seamen have some valid excuse for not fulfilling their contracts or give timely notice to rescind, that is another matter. Then, again, another gets an allotment note in the way of advance, goes to some simple-minded person (such cases can be confirmed), gets money upon it, and—"bolts." Is such a man not deserving of punishment. Another gets cash at the pier head, and unless closely watched, and perhaps in spite of watching, runs off, leaving a few rags behind him. Surely this is equal to "obtaining under false pretences;" but still he goes without a scar. We say emphatically that such a system is a premium upon loafers and crimps. Hundreds, if not thousands of men who have been convicted of the most serious offences are shipped under false colours, principally in American and Continental ports. Some quarter of a century ago our Mercantile Marine was flooded with them, and the cry arose that our seamen had deteriorated. So they had. Why? Because of the influx of such characters owing to the laxity of discipline. A firm hand was laid upon them at several ports, notably the two Shields, Sunderland, Liverpool, London and Cardiff; the bad were considerably weeded, and the good allowed to develop. Now the case is somewhat reversed, and the "bad" old state of things is too surely and likely to revive. Not that we advocate punish-

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ment to seamen, as seamen. We say punish and suppress that which is really evil, and that which remains will be all the more blest in itself and its action.

DUTCHMEN v. BRITISH SEAMEN.

THE foreign seamen in our Merchant Navy are, taken in the order of their numbers, first Dutchmen, second Lascars, third Niggers, fourth Chinamen, and fifth Dagoes. Any seamen who hails from any port between Holland and the Baltic is called a Dutchman. These men serve a long apprenticeship in sailing vessels, the discipline they are subjected to is severe, their diet is extremely frugal, but sufficient. It requires good seamen to navigate to or from the ports of the North Sea and Baltic; hence, as a rule, these men are hardy, civil, obedient, and above all, sober. While they are in our vessels they save money, and are thus out of the clutches of crimps and boarding-house keepers. They are cleanly and always well and neatly dressed so far as their duties will permit. As a ship-master, I have had in safe keeping the bank books of a Dutch crew, the sums saved ranging from £27 to £118. When a vessel arrives in port at the end of a voyage these Dutchmen leave the ship cleanly and neatly dressed; they do not drink, and while the vessel is unloading, if they intend reshipping in her, frequently come down to have a look "at the old ship." They are civil to the officers and that civility is returned. Many of these men are educated, and in addition to their native language (Norwegian), Swedish, Danish, Dutch, or German, they speak at least another language, French or German. They are all young men and they join our service to learn English thoroughly, and to *handle* vessels under steam. When they have acquired English and think they understand steam-vessels they return to their country and become officers, and in time commanders in their own vessels. I, like hundreds of masters, prefer them to Englishmen, whom I would not carry as ballast if I could avoid them, for reasons which I will

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give in this paper. I need say but very little about the next class of seamen, Lascars; if fairly treated they are civil, industrious, sober and obedient. Vessels can be kept much cleaner with these men; one objection to them is that they are *used up* in cold weather, and this is most important in a sailing vessel, or in a steamer carrying much canvas. Niggers;—I do not use the term in its offensive sense, but simply as all seamen do. The negro seaman is, as a rule, a sober, honest, industrious and good-humoured fellow. Mixed with English seamen, negroes do not get on, there is at all times a considerable amount of ill-feeling. A West Indian negro A.B. is just as smart in a temperate climate as the English A.B., he is always better clad, more careful, and can at all time, and under all circumstances, be depended on for sobriety. While on shore he is dressy, and delights in boasting how comfortable his wife is, *who he says* is a white woman. Yes, sah! He is a capital mimic, often a good dancer, musical, sings a good song, and often in the dog watches will amuse the ship's company when an English A.B. would be growling like a "bear with a sore head." A crew wholly composed of negroes does not answer. Seeing but three or four white men in command of them, they become as they express it "dam sassey," then follows the trouble of Consuls, Vice-Consuls and magistrates, backed up by the Wilberforce mob in London. As cooks and stewards they are unequalled. Chinamen in their own waters are good men, whether forming whole, or part of ships' crews. Away from their own country they should be mixed with Englishmen. They are good firemen, and like the negro make good cooks and stewards.

Dagoes is a term applied to a crew composed of Greeks, Italians, Maltese, and perhaps Manillamen; they are a dangerous lot, and only shipped when no others are obtainable. Such a crew would be found now in New York and possibly in Liverpool. Vessels known as Coast of Guinea-men, used, in my time in sailing vessels to engage such men. They stood the African climate better than other men, and even if they did not they could not understand sufficient English to know where they *were* going, or what pay they were to receive. A ship was bound there and men had to be obtained *somehow*. The owners of these vessels, some of them

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very wealthy men (and *some of them M.P.'s*) gave so much a head for a crew, the crimp putting them on board and obtaining the mate's receipt for them. These poor wretches were often "Shanghaied," that is, drugged, and then shipped. Hence the mutinies and murders now happily few and far between. It used to amuse me to read the speeches of some of these shipowners when I was a young man, and second mate in a Coast of Guinea-man. Speeches teeming with patriotism, charity, and morality, while their vessels were manned in the manner I have described. On the coast nothing was thought of flogging these men; Kroomen or Negro labourers would flog them at the bidding of the trading captain, who resided in a hulk in one or other of the rivers, and represented the Liverpool firm in the bartering business. Cabmen, gardeners, and stone masons have been *Shanghaied*, dressed up as sailors, and shipped for Coast of Guinea-men. *This* to avoid *paying the higher wages* demanded by the *then* good English A.B. for going a voyage to the White Man's Grave. The crews of these vessels were shipped, or "signed on" for three years; and to be *transferred from ship to ship* in the same employ at the same rate of wages. If a member of a ship's crew was ill-treated, *he* or his witnesses were sent away, up or down the coast; so ended all bother. Dagoes formed the crews of the *Caswell* and I think also of the *Linda*. The *Flowery Land* was manned by Manillamen.

I will now endeavour to trace the "decline and fall" of the English seaman. I will first state that for pluck, daring, and endurance *under difficulties*, the English seaman is unequalled all over the world. He is also unequalled in discontent, drunkenness and shirking out of an engagement which he enters into with his eyes open—sometimes; if they are not open to his own interests he has no one to thank but his "dear friend" the crimp, a wretch who is the Jackal of boarding-house keepers, slop tailors, and numerous other horrible characters who only take up their residence in close vicinity to our docks—be those docks old or new. No doubt, *before* Royalty has declared a dock open, the surroundings of these depôts for vessels are already let to Jack's enemies.

Jack, I must admit, has never had much chance of bettering his condition. For *forty years* he has had the same scale of provisions;

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the same "salt horse," the same biscuit, generally made of horse beans, bone dust, and Canada timber, this same infernal diet *as per scale;* this, bear in mind, with all our improvements in steam and steamships. It matters not whether poor Jack is blundering across to the States in a modern cargo tank, up to his middle in water, best part of the passage; it matters not if he is exposed at an unenclosed wheel for hours. The collective legislative wisdom of this great empire says, or has said, and still says, Jack must eat so much salt junk, and as a digestive accompaniment so much of the villainous compound described as beans and Canada timber. Jack may be in a tank known to seamen as a foreign collier, and at this very moment steaming down the Red Sea. It is dreadfully hot, fearfully so — still the same Act of Parliament diet. I ask your readers, who compose so large an amount of the English public, what heart can a man have to keep up 70 lbs. or 80 lbs. pressure of steam on a boiler, who is fed on salt junk and Canada timber? This applies to our firemen, who are also seamen in the eye of the law. What heart can Jack have, who has to perform the thousand-and-one duties required of him in our undermanned sailing vessels and steamers, on such a diet? True, he occasionally gets a little "bully soup," as he terms it; that is, preserved meat, now better known as canned meat. Jack has been told by someone that this preserved meat has lost its best qualities, taken from it before being canned to make "extract of beef" for invalids of the higher classes. There may be some truth in this. English seamen have never been properly fed; they are not properly fed now, hence the best men are now to be found in our coasting and Continental steamers, known to seamen as "Weekly Boats." In these vessels Jack finds himself being allowed a small sum in addition to his wages. Many good, steady, sober seamen are in our fleet of yachts, Trinity House steamers, and as quartermasters in our splendid lines of steamers, such as the Orient Line, the Peninsular and Oriental, Cape Lines, and those lines of steamers running regularly to India and China. Here they are well treated. The discipline is excellent; the seamen have habitations less like dungeons, and Jack can get to the wheel without being washed about the decks. And when he

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gets to the wheel he *can* steer her without taking off his coat and rolling up his sleeves—more than can be said of nine-tenths of our cargo boxes. There is another class of able seamen—those who have served an apprenticeship; these men will all be forty years of age and upwards. It is certainly that time since the regular apprentice had to give way and make room for the *gold-laced* premiumed apprentice. This was the first blow given to our school for seamen—that blow was struck by the ever-greedy ship-owner. The new apprentices paid from £50 to £60 premium, in addition to which they bought half their food from the captain. These lads, sons of genteel parents, simply learnt nothing, unless to drink rum and play cards formed a part of seamanship. On arrival in England with their ships these lads, with their sunburnt faces and bran-new uniforms, went home to their parents in the country, astonished the yah-hoos, delighted their sisters, grieved their mothers, and drove the clod-hopping Venuses into a mild form of madness. These were the lads who formed the thin edge of the wedge that drove our poorer boys out of the Service. Poor boys could not go home on the termination of a voyage; the owner would have to feed them; food is the secret of the disappearance of the apprentices who made good seamen and better commanders. The apprentices going out upon the advent of the gold-laced type must now be forty years of age; those who are not in command of sailing vessels or steamers will be found filling every conceivable situation in our Australian Colonies and in New Zealand. They are also in the United States and in California in large numbers. I question very much *if either* of these countries could not produce more English seamen in a given time than England. Under-manned vessels and a victualling scale fit only for dogs, and supported by owners who built churches, drove Jack to more congenial countries, where he still remains—sober and well-behaved *now* that he receives the treatment due to a human being.

I come now to the more modern A.B.; the production of the premium and gold lace process; wrecks with enough education to make them a curse to themselves and to others, soured, disappointed men who might have done well if their parents had given

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them a fair start in the world, and less indulgence. The next class are reformatory ship A.B.'s, who started their seafaring life as officers' servants and ship boys, messroom stewards, &c. These fellows are pukey, cock-sparrow individuals, the offspring of gin and sprats, crammed full of *canned seamanship* and *desiccated* marine information; who also have a smattering of "*lawer*," gathered at police-courts. This wretch would be dear if *he* paid a premium for permission to go to sea. Reformatory ships supported by the ratepayers, were no doubt a grand idea for the production of ready made tars, for *shipowners' convenience*: but the system does not work satisfactorily.

These are the seamen on whom we have to depend if we exclude Dutchmen; and even of this sample there are not very many. Startling as may be the fact, the British seaman who *is* a seaman, has left, gone; so far as England is concerned he is as extinct as the Dodo. Driven into foreign countries, into exile, Jack has made a home for himself, his wife and children, and there he will remain. It is simply astounding to observe the immense change which better treatment has wrought in the ex-British seaman as we find him in the United States and in our colonies of Australia, New Zealand, and British North America, both on the east and west sides of the continent. In these countries the ex-British seaman is to be found in every conceivable employment, where strength, skill, pluck, a quick eye, and fertility of resource are elements required by his employer. As a master in the British and Colonial Mercantile Marine I have met eminent contractors who preferred the British seaman to any other labourer. When engaged in the transport service I was certainly surprised to find "Merchant Jack" in the Sappers and Miners, the 78th Highlanders, the Welsh Fusiliers, and in cavalry regiments. They are to be found also in the Cape Colony as police. Hundreds have been enlisted as Cape mounted and armed police, and are now merged into the Imperial mounted rifles, and from which no doubt we obtained the modern idea of mounted infantry. On the mountains and plains of Australia, Jack took refuge as a digger, I may say pioneer digger, from his hard employer, and his infernal diet of "salt horse" and

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biscuit of bone dust, horse beans, and Canada timber. The snowy ranges and dense gullies of New Zealand were equally a home to the British seaman driven from his legitimate employment by the shipowner, who, although always pleading poverty as an excuse for half-starving his seamen, died worth millions. Hence "Skippers Gulley," "Sailors Creek," and other rich claims, now subjects of history, denote where the British seaman flitted to, to get clear of what he termed the d——d limejuicers (British ships).

In my "Australian" day it was the boast of the Colony of Victoria, that in the event of a European war, she could in twenty-four hours muster eighty thousand British seamen, armed with picks and long-handled shovels to throw up earthworks, *and ready to go to sea when it was done.*

"Jack" is found in British North America farming, rafting timber and in lumber mills. He is a policeman, a fireman, anything in fact, but sea, no more sea, no more limejuice, no more salt horse, with *never* a holiday. Jack, and for that matter thousands of men who are now masters, can truly state that not one Christmas Day stands out in their recollection as a holiday. Sunday, Jack either went to sea (this is kept even now) or cleared hawse, or washed decks. Jack was never allowed a whole Sunday, or Good Friday. He got a holiday when he arrived home, when the generous owner had done with him. In the United States of America our "Jack" will be found in coasters, pilot schooners, car-drivers, yachts, as stevedore's labourers, working at elevators, and in canal boats and on the lakes. In America it would be difficult to recognise the ex-British seaman. In nine cases out of ten he would deny he ever was one.

Even now with 80 per cent. of Dutchmen in our service, *who put up with anything and everything*, the modern managing owner is not satisfied, he wants more, he wants a *foreign shipmaster*. This loyal subject, this manager of other people's money invested in rotten A1 100 ships, *advertises* for a master, but no English need apply. What is his object in doing this; I will reply for him. The English shipmaster *sees too much.*

It would be no easy task to weed out the 80 per cent. of Dutch-

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men, for, thanks to Madame Redtape, although Jan Stensen may be a Dutchman, *he* holds a V.G. discharge as A.B., and is in the books of the Registrar of Seaman, *Andrew Murray*, native of Inverkeething, N.B. In the event of a European war who is to prevent my Dutch crew taking my command from me, she is worth £37,000, her cargo £28,000, and running her into Hamburg, Bremen, or any other port. My crew are all Dutchmen. My mate is a Norwegian, my second mate is a German, my boatswain is a Swede, my carpenter is a Swede also. Why are my crew all Dutchmen? Because the modern managing owner (who must live like an ancient prince and must buy valuable paintings and keep sixteen servants in a 32-roomed house) works the soul out of Englishmen, starves them, keeps them at it night and day, Sundays, holidays and all other days. It must be done to keep up his establishment.

TWENTY YEARS IN STEAMSHIPS.

THE CHANNEL TUNNEL AND OUR CONTINENTAL CARRYING TRADE.

THE Channel Tunnel question has been before the public some little time, but hitherto few criticisms have appeared against the establishment of a submarine way between the Continent and this country which have any real weight. Recently, however, Mr. Frederick Calvert, Q.C., has written a useful letter to the *Times* on the subject, and in connection with our Mercantile Navy has drawn attention to certain points which are worthy of consideration. We do not share his fears as to the serious injury likely to accrue to our carrying trade in the event of a tunnel being constructed, but we do think shipowners should be alive to the possible competition which may arise, and by despatch, economical freights and other facilities, be able to hold their own against the threatened invasion of their cargo traffic between this country and the Continent.

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We reprint for the information of our readers the principal parts of Mr. Calvert's letter to the Editor of the *Times*:—

"The question which I suggest is, What effect will the tunnel have upon our Mercantile Navy? A Mercantile Navy in unlimited numbers is in the possession of England alone. Other nations can build ships, and can gradually provide them with crews. England alone, in case she goes to war, has the power of at once collecting a fleet, transferred from commerce to war, and of enlisting immediately a supply of seamen inured to the trials and perils of navigation. Merchant ships can readily be engaged as transports and for many of the services of war, and mercantile seamen are in reality recruits, who may quickly become fit to man ships of war. Such being the source from which England, alone among nations, can at any moment bring an enormous naval strength into action, the Legislature is bound to resist the proposal of any undertaking, public or private, which may be calculated to injure it. When I speak of a tunnel in the singular number, I must add that, if one tunnel is successful there will certainly be more than one. Already two tunnels are proposed. If traffic is to pass by tunnel, there are sure to be as many tunnels as the traffic may require.

"In the present state of our communications all goods which go from or come to England must of necessity undergo at least one change from land to sea, or from sea to land. In any trade, whether with Europe or with any other part of the world, there is the same necessity. All goods must undergo a process known under the expression of 'breaking bulk.' If by a system of tunnels between England and France land communication with the Continent were rendered possible, goods from all parts of Europe might be brought into this country without 'breaking bulk,' and might reach their destination with increase of certainty and dispatch. Nor would this be the case with regard to European traffic only. Suppose goods to be coming from India or Australia, it might be well worth while to land them at Brindisi, or Trieste, or Constantinople, or Odessa, or Marseilles, and to convey them for the rest of their journey by railway. By this means the uncertainties of the western portion of the Mediterranean, of the Atlantic along the coasts of Spain and Portugal, and of the Bay of Biscay would be

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avoided. There would be a 'breaking bulk' at one of the Mediterranean ports, but the truck loaded there might be conveyed without further change to any town in the interior of England. Were such an alteration to take place in the conveyance of mercantile goods, it is hard to say to what extent a diminution in our Mercantile Navy might be the consequence. Whatever might be the diminution would be a diminution to that extent in one great reserve of that naval power which enables England to set at defiance the hostility of all foreign nations. The transit of all exports and imports by our coasts has given rise to large towns and populations where the transit is carried on—for instance, Hull, Liverpool, Dundee, Glasgow, and London. These seaport towns are the great nurseries of our Mercantile Navy. Take from them any considerable portion of the transit trade, and their prosperity might be seriously affected.

"Immediately connected with these towns is the coasting trade. Vast quantities of goods come to these ports, and are distributed by coasting vessels along our shores, to be landed at any safe seaport which is near to their destination. Were Channel tunnels available for traffic, goods of this character might be carried direct to their destination without touching the coast. Thus both the seaport towns and the coasting trade might be injured by the change, and become less useful to the country as the nurseries of seamen. Indeed, if these tunnels are to be thoroughly successful, there must be a perfect revolution in the conduct of trade and in the circumstances of these large towns and of the coasting traffic, and a serious change for the worse in the condition of the Mercantile Navy.

"It will, however, be said that if Channel tunnels would draw so large a quantity of traffic from the seaport towns and coasters, the reason must be that, of the two modes of conducting the traffic, that by the tunnels must be the more economical; in truth, that the pecuniary advantage accruing to commerce might be not incorrectly gauged by the amount of traffic withdrawn from the coasts, and, as a consequence, that England would be making a sacrifice if she were to deny herself the advantage of an uninterrupted land communication. With those who believe that

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the greatness of England entirely depends upon the profits of commerce, this argument will be irresistible. But those who think that the greatness of England depends in a far larger measure upon higher interests will be of opinion that those higher interests must not be sacrificed to considerations of trade; nay, more, they will be aware that the sacrifice of those high interests would certainly involve a decline in various branches of trade. If England ceases to maintain the highest position in the scale of nations; above all, if she ceases to enjoy her present complete security from foreign attack, if the sources of her naval superiority are in any way impaired, her commerce will undoubtedly be injured. The capitalist requires that the country in which he casts his venture shall be secure not merely against internal disorder, but also against foreign aggression. Of all the countries in the world, England carries on the largest commerce, and sends her shipping into all parts of the world with the greatest security; and she is considered so safe a country for investment that her Government stock is held in large amounts by foreigners, although the dividends which she pays are at a far lower rate than the rates paid by the Governments of their respective countries. One main reason why she has these great advantages is that she has hitherto been free from all risk of foreign invasion, and that she is capable, in case of absolute necessity, of showing herself as superior in the struggles of war as she is in the occupations of peace. Were she to forfeit this warlike character, other nations would soon become paramount, England would fall into an inferior position, and the first to suffer from the diminution of her authority would be the trading community."

Disappearance of an Island.—The U.S. Consul at Carthagena, United States of Colombia, reports that Zamba Island, shown on the chart in about latitude 10° 48′ N., long. 75° 20′ W., has recently disappeared, and that two steamers and a brig nearly grounded on the banks formed on the former position of the island. Vessels are cautioned not to approach very near the position of Point Galaria on account of the strong current setting in that direction.

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MANCHESTER AS A PORT.

AT present Liverpool is the port from which Manchester goods are shipped for foreign markets, but the Manchester people are much dissatisfied with the means of communication between the two towns, chiefly on account of the heavy charges for transport of their goods to the port. The project of a ship canal from the nearest navigable part of the River Mersey to Manchester, has consequently been received very favourably by those interested.

A counter project has recently been put forward, which will, we imagine, hardly be so acceptable to Liverpool as the ship canal into the Mersey. The new plan is to utilise the Estuary of the River Dee, and from the present inland town of Northwich, to make a very broad deep-water channel up the river to a point within twenty miles of Manchester, and to connect the waterway so developed with the town by means of a ship canal, having two or three locks. This would enable vessels of large size to go right up to Manchester, and there discharge or take in their cargoes. These appear to be somewhat bold anticipations, but the Manchester people have a powerful incentive to carry one or other project into execution, so that they may free their goods from the heavy costs laid on them by the railway company and, as they assert, by the port authorities of Liverpool.

We understand that funds are being raised to defray the expenses of applying for Parliamentary powers to enable one or other undertaking to be proceeded with, and for thus taking some practical steps towards the development of the port of Manchester.

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CORRESPONDENCE.

COLLISIONS AT SEA.

To the Editor of the "Nautical Magazine."

Sir,—Having read articles in the *Nautical Magazine* on Channel Navigation, Collisions at Sea, &c., I beg to introduce another wrinkle which, in my opinion, has been a great deal neglected, that is, the height at which side-lights are generally placed.

Is it not plain to all that the higher they are placed the further they can be seen? Then why not always place them in the highest convenient part (say on the bridge, level with the officer's head).

It is the custom in most steamships to have a fine weather and a bad weather box for the side-lights (of course, one higher than the other), and the lights are always kept in the fine weather box till the sea washes them out. In bad weather how far can they be seen from another steamer approaching at a high speed, that probably will have to keep out of the way? I venture to say that often they cannot be seen till too late to avoid a collision, although the mast-head light was seen fifteen minutes previously. The result—a Court of Inquiry—the defence on both sides being—lights burning bright, &c., &c.

The height at which side-lights are generally placed is a matter that ought to be brought prominently before the seafaring community and others interested.

Pardon me for intruding so much on your valuable space.

I am, Sir, yours truly,

Liverpool, September 15, 1882. JACK TAR.

ANGLE OF RUDDER WITH HELM HARD OVER.

To the Editor of the "Nautical Magazine."

Dear Sir,—Now that collisions are so prevalent, I have often wondered if there can be any reason why the rudders of steamers should not be so constructed, that when put hard over, they

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would be at right angles with the keel, instead of being at an obtuse angle, as at present. I believe it would be a very simple matter, with steam steering-gear, and that it would have more power over the vessel, therefore turn her quicker. Going full speed astern, it would not be advisable to have the rudder at such an angle, as it would cause a great strain on the gear, but in such a case the helm need not be put hard over.

Yours truly, L. L.

[Our correspondent L. L. appears to misunderstand the action of a rudder. We are advised that the manœuvring effect of paddles with disconnecting engines, of twin screws and of a cart with one wheel blocked, are all due to producing a difference between the resistance to progress on one side and on the other, that which is less resisted or more propelled goes faster than the other, and the vessel in that way has to go round just as a one-legged pensioner does when his timber-end gets fixed in a hole. The action of a rudder is quite different from any of these: it acts by deflecting the water *side*-ways, and not at all by fore-and-aft drag. A rudder at 90°, as proposed by L. L., could have no side-way action, and therefore no rudder effect. The action of a rudder is very much more efficient than disengaged paddle-wheels or twin screws. Either of these have turning power proportional to their leverage or distance from their line of action from the line of keel; the 90° rudder would also have its steering effect proportional to the distance of its centre of effort from the line of keel, and therefore it would be, practically, nil for steering. As an impediment to the progress of the vessel, or a ready way to break down the rudder, the suicidal force of the plan proposed would be no doubt safe to succeed.

In a vessel with infinitely fine run aft the turning force of the rudder, at any given speed, is as the product of the cosine by the square of the sine of the angle of the rudder. This gives the maximum effect for that angle of inclination whose cosine squared is half of its sine squared, that is 54° 44′. As the run of the vessel aft becomes fuller the sideway force of the rudder becomes

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less, and the angle for maximum effect is also reduced, and in vessels of the usual form aft there will be no increase of steering effect beyond 45°. As the increase of beneficial effect is slow near that angle, while the drag on the ship and the strain on the rudder gear are at the same time rapidly increasing, it is advisable to keep well under 45°.—Ed. *N. M.*]

FAIR TRADE.

We have received a further communication from "Protectionist," but regret our inability to afford space for the continued discussion of this subject. "Protectionist" informs us that his views are stated at length in a pamphlet entitled "The Principles of Free Trade Examined," copies of which may be obtained through Messrs. Pewtress and Co., the printers of this Journal.

BOOKS RECEIVED.

Plan for greatly Reducing the Risks of all Ships at Sea, but more especially those Laden with Coal. By Archibald T. Miller, R.N., Commanding School Ship *Conway*, &c. Liverpool. 1882.

Most of this pamphlet is taken up with the description of proposed improvements in ships with a view to obviate the losses at present caused by Fire, Foundering from Leaks, Collision, and Stranding. The idea is to have ships either built or altered so as to have "hermetically-sealed holds or compartments" and to provide on deck "an air-pump of good size" which can be connected with each such compartment. If a ship has a coal cargo, and fire is suspected, the remedy is to close up the compartment and exhaust the air from it, and then the fire will die out. It is also proposed to introduce carbonic acid gas in place of the air pumped out. The first necessity is that each compartment should be really air-tight. To effect this it is proposed that iron ships must always have a complete iron deck; the bulkheads must have no sluices or

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other openings in them, and the hatchways should be closed in by means of a shutter in each case, running under the beams in horizontal grooves, to be made watertight when in place by being screwed up tight against indiarubber cushions all round the hatch coamings. We may in the first place remark that Mr. Miller, although he appears to have given much thought and care to the subject, so little appreciates the practical conditions necessary to obtain a water-tight or air-tight shutter, that he speaks of his sliding covers as being so easy a means of closing up the hatchway that if they were fitted there would be fewer accidents from imperfectly closing cargo hatchways at night or other times than is the case at present. "A handy means of closing the hatchway," he says, "would leave no excuse for not at once doing so when work was over. The last man to come up would give the sliding shutter a pull, and the whole thing would be done." We should be rather inclined to think that a shutter capable of closing air-tight an ordinary hatch of the present day would be more likely to require an easy pull from the steam winch than from one man to draw it across a horizontal groove.

It is not, however, generally in new iron ships built for the purpose that coal is carried for long voyages; and it must be remembered that there are other dangers besides spontaneous combustion connected with coal cargoes. The Board of Trade surveyors frequently detain vessels on the ground of their not being fitted with provision for surface ventilation, and such provision necessitates the cutting of holes in the deck independent of the hatchways. Of course such apertures and all other necessary openings could have air-tight shutters, and ships could be built so as to have air-tight holds. It would be possible also to alter ordinary ships on the air-tight hold plan to put all the accommodation and the stores and cable either above the upper deck or in specially prepared air-tight chambers. It would, however, require very much more power than "the windmill," or any available "hand-power," which Mr. Miller reckons upon to make up for inevitable leakage.

A further advantage which Mr. Miller hopes to obtain by air-

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tight holds is the prevention of disaster caused by the vessel foundering through a leak. "By means of the air pump," he says, "a pressure of air within the hold can be maintained, and it is certain that all water from leaks can be excluded by such means, for we see in the diving bell a vessel without any bottom at all, where all water is kept out by a higher pressure of air within. There can be no doubt, therefore, that the plan will keep water from entering by an ordinary leak." We would remind Mr. Miller that if a hole be put through the side of a diving bell the pressure of air will not prevent the water rising inside to the level of the hole; the application is obvious.

Air-tight holds, however, we are told, have still further advantages. By an arrangement of air-tight chambers connected with exit pipes forward and aft, the air which has been stored up under pressure in the hold may be suddenly liberated, and thus the ship could be quickly stopped or her speed accelerated as might be required. It is proposed to acquire this reserve of power gradually during the voyage by means of a windmill or hand air-pump, or at most by a deck donkey-engine. Further, the reserve of power accumulated by this means might be used to assist the propulsion of a sailing vessel in the calms of the Equator. We should recommend Mr. Miller to go into figures in connection with his proposals, and we think he will then not fail to see how utterly inadequate are his means to either of the ends proposed.

The remainder of the pamphlet is occupied by a proposal to arrange for boats being launched rather than lowered in case of emergency. A single davit with a claw head would be used to take in the boat, and when launching her in bad weather the boat would be placed bow on to the ship's side, the crew would get in and she would be launched off at once clear of everything. On this part of his subject Mr. Miller is thoroughly at home, and we should think that circumstances might arise where his plan would be the best for getting a boat away from a ship. The difficulty would be, in a heavy sea, in choosing the right moment to launch, and we are inclined to think that generally the balance of safety would be with the old plan.

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Liste Annuelle de Yachts Francais, Belges, Espagnols, Italiens, Portugais, &c., 1882-1883. Publiée par MM. R. Vulliaume et B. Clerc, Paris: Aux bureaux du "Yacht" 50, Rue St. Lazare. London: Norie and Wilson.

YACHTING appears to be growing in favour with our neighbours on the other side of the channel. They have a well conducted weekly journal *Le Yacht* devoted to "la navigation de plaisance," and now the first issue of an annual yachting list is commenced, on a similar plan to that of "Hunts Yachting List" published in this country. The information given is clear and comprehensive, and the way in which the little book is got up compares very favourably with the style of the English publication, the drawing and colouring of the various flags being especially excellent. A chapter on the use of the flags of the International code is a valuable addition to the work.

Aberrations of Audibility of Fog-Signals, a paper read before the Philosophical Society of Washington, by Arnold B. Johnson, Chief Clerk of the United States Lighthouse Board. Washington: Judd and Detweiler, Printers. 1882.

THE object of this paper is to call attention to some erroneous popular notions regarding the audibility of sound-signals, but chiefly to demonstrate the variability of the sound range under different atmospheric conditions, and even at different times in the same day. It happens that Professor Tyndall in this country has recently been dealing with the same subject, and that observations are at the present time being made by officers in the Trinity House service in reference to the occurrence of what Professor Tyndall terms "soundless zones." It would seem that cases not infrequently occur of the sound from a fog-signal being audible up to a certain distance from the signal, then becoming inaudible, but on proceeding to a still greater distance, the sound is again picked up. The possible existence of such belts of inaudibility, or "soundless zones" is a matter to be taken into consideration by a mariner who is desirous to avail himself of a fog-signal. Perhaps some of our readers may have experiences on this point. We shall be glad to give publicity to any.

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As regards other aberrations of audibility treated of by Mr. Johnson, they have all been previously dealt with in our pages, and are, we believe, pretty generally known. On the American coast, fog-signals are used much more for leading purposes than with us, and Mr. Johnson formulates a series of useful suggestions for the guidance of mariners who rely upon such signals overmuch. Our coasting traffic is however neither so extensive nor so urgent as that of the United States, owing probably to the network of railways which is spread over our small islands, and mariners are not encouraged to depend upon sound-signals for leading purposes, with the same definiteness as they make use of the lights from lighthouses. It is considered with us sufficient to regard a sound-signal as a simple warning, which when heard says emphatically, "keep away from me," and to this extent it is most valuable. Mr. Johnson's paper will be a serviceable addition to the literature of the subject, especially as he gives some interesting accounts of actual experiments recently carried out.

Tide Tables for the British and Irish Ports, for the year 1883; *also the times and heights of high water at full and change, for the principal places on the globe.* Computed by Staff-Commander H. R. Harris, R.N. London: Printed for the Hydrographic Department, Admiralty.

THE month of October usually brings the "Admiralty Tide Tables" for the succeeding year; and we hasten to inform our readers that the Tables for 1883 are now published. It goes without saying that the information given in this work is of great value, but we have reason to suspect, from the results of "Official Inquiries," that the part devoted to the discussion of the tidal streams, &c., around our coasts does not receive the attention of our seamen to the extent it ought.

A Treatise on Marine Surveying. By Rev. J. L. Robinson, B.A., Royal Naval College. London: Macmillan and Co. 1882.

ALTHOUGH there are several works already in existence which treat on Marine Surveying, there is nevertheless ample room for

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the well-arranged, clearly-written, and explanatory treatise on the same subject by the Rev. J. L. Robinson. It is stated to have been prepared for the use of younger Naval officers, but we would commend it to the special attention of officers of the Merchant Service, who, we feel sure, would rise from its perusal and study with a more perfect knowledge of their chart, and the instruments they daily use in determining the ship's position. The table of contents briefly indicates the order of treatment: 1. Symbols used in Charts, &c.; 2. Construction and Use of Scales; 3. Laying off Angles; 4. Fixing Positions; 5. Chart and Chart-drawing; 6. Instruments and Observing; 7. Base Lines; 8. Triangulation; 9. Levelling; 10. Tides and Tidal Observations; 11. Soundings; 12. Chronometers; 13. Meridian Distances; 14. Method of Plotting. Portions of the work may be out of the range of the ordinary navigator, but the larger part should be well understood by him, and he will seek in vain in other books for an exposition so clear as in this treatise. As a manual or text-book on the subject on which it treats, it is a model of orderly arrangement, and it should undoubtedly be welcomed by young Naval officers who are called on to undergo an examination in nautical surveying and the instruments appertaining thereto. The questions for examination and exercises are not the least important part of the work, while a good index enables the student to instantly turn to any required point on which he wishes an explanation. Throughout the book there is no "cram;" it is sound reading, and requires careful study.

Our Library Table.

The monthly supply of *Notices to Mariners* and *Hydrographic Notices*, British and Foreign, are to hand, and are more numerous than usual, as may be seen by our compilation of "Nautical Notices" for this month. The books, pamphlets, and papers on our table are as follows:—*Van Nostrand's Engineering Magazine* (New York), for October, in which Lieut. H. H. Ludlow, U.S.A., has something more to tell about the construction and use of "subscales, including verniers," and furnishes a very instructive paper on the subject. *Neue Methode zur Erleichterung der Bestimmung des Schiff*

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sortes, der Variation und Deviation des Compasses, aus astronomischen Beobachtungen ausser dem Meridiane, (Hamburg) by Captain H. Heyenga, is a new method of determining a ship's position, &c., by observations of a celestial object off the meridian, for which purpose special tables are given, and which are equally available for Sumner's method. *Annalen der Hydrographie und maritimen Meteorologie*, Heft IX., contains, besides the usual nautical subjects, a synopsis of the deep-sea investigations of the French ship *Travailleur* in the Bay of Biscay, the Atlantic and the Mediterranean, a paper by our old friend E. Knipping, of Tokio, on the typhoons in Chinese and Japanese waters, during the year 1880; and an interesting note on the history of problems relating to triangulation in connection with surveying, by Professor G. D. E. Weyer of Kiel. *Nautisch technisches Wörterbuch der Marine*, by P. E. Dabovich (13 parts of which are to hand), is a general explanatory dictionary of sea terms in German, Italian, French and English, and so far appears to be a carefully compiled and comprehensive work, embracing navigation, seamanship and the marine engine. The *Boletin de la Sociedad Geográfica de Madrid* for September has a good paper on the Tonga and Samoa archipelagos. *Le Congrès national de Géographie de* 1880 *à Nancy* and *Bulletin de la Société de Géographie de l'Est* (numbers for 1881-82) indicate that as much interest is taken in Geography in the large provincial towns of France as in Paris. The *Revue Maritime et Coloniale* (Paris, for October), has a few notes on Madagascar, chiefly in reference to the people and productions of that island. The remaining periodicals to note are the latest numbers of *Rivista Marittima* (Roma), *Revista Maritima* (Brazil), *Hansa*, *Das Schiff*, the *New York Maritime Register*, *Forest and Stream* (U.S.), the *Nautical Gazette* (U.S.), and *Le Yacht*.

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TIDE TABLES FOR NOVEMBER, 1882.

Also Ports of Reference for the Constants in the next Table.

Week Day.	Month Day.	LONDON BRIDGE.		HULL.		NORTH SHIELDS.		LEITH.		DEVONPORT.		DOVER.		WESTON-SUPER-MARE.		LIVERPOOL.		GREENOCK.		QUEENSTOWN		KINGSTOWN.		LONDONDERRY.		BREST.	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
		H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
W	1	5 24	5 48	10 4	10 30	7 1	7 29	5 58	6 24	9 4	9 27	2 39	3 2	10 12	10 33	2 31	2 55	3 21	3 45	8 34	8 57	2 31	2 57	11 47	—	7 22	7 47
Th	2	6 12	6 39	11 0	11 33	7 58	8 30	6 52	7 24	9 51	10 18	3 26	3 51	12 57	11 26	3 20	3 49	4 9	4 35	9 22	9 50	3 24	3 54	0 22	0 59	8 14	8 45
F	3	7 7	7 39	—	0 8	9 5	9 41	7 59	8 36	10 48	11 21	4 18	4 47	11 58	—	4 23	4 59	5 5	5 38	10 22	10 58	4 27	5 1	1 40	2 20	9 19	9 56
S	4	8 12	8 49	0 43	1 17	10 18	10 55	9 13	9 50	11 58	—	5 18	5 53	0 32	1 9	5 38	6 18	6 16	6 52	11 35	—	5 36	6 10	2 56	3 29	10 35	11 13
S	5	9 29	10 6	1 51	2 23	11 29	mid.	10 23	10 53	0 35	1 11	6 27	7 0	1 47	2 22	6 56	7 29	7 26	7 59	0 12	0 46	6 43	7 14	4 0	4 27	11 47	—
M	6	10 40	11 12	2 54	3 23	—	0 29	11 22	11 48	1 44	2 15	7 32	8 1	2 55	3 26	7 59	8 25	8 30	8 59	1 19	1 49	7 44	8 11	4 50	5 11	0 18	0 46
Tu	7	11 38	—	3 50	4 14	0 53	1 14	—	0 8	2 43	3 9	8 25	8 46	3 55	4 21	8 47	9 7	9 23	9 44	2 14	2 36	8 35	8 57	5 29	5 47	1 10	1 31
W	8	0 2	0 24	4 34	4 52	1 33	1 51	0 27	0 45	3 32	3 54	9 6	9 26	4 44	5 6	9 25	9 43	10 4	10 24	2 57	3 17	9 18	9 37	6 6	6 23	1 50	2 8
Th	9	0 43	1 3	5 10	5 28	2 8	2 25	1 3	1 21	4 15	4 35	9 46	10 5	5 27	5 47	10 1	10 18	10 43	11 2	3 37	3 56	9 54	10 10	6 41	6 59	2 26	2 43
F	10	1 20	1 36	5 46	6 4	2 42	2 58	1 38	1 55	4 53	5 11	10 24	10 43	6 6	6 25	10 35	10 52	11 21	11 40	4 14	4 32	10 26	10 42	7 18	7 35	3 0	3 17
S	11	1 54	2 10	6 21	6 38	3 14	3 31	2 12	2 29	5 29	5 46	11 2	11 21	6 44	7 2	11 9	11 27	11 58	—	4 50	5 8	10 58	11 15	7 52	8 8	3 34	3 51
S	12	2 26	2 42	6 56	7 14	3 48	4 5	2 45	3 1	6 8	6 20	11 40	11 59	7 20	7 38	11 45	—	0 16	0 34	5 26	5 44	11 33	11 51	8 24	8 40	4 8	4 25
M	13	3 0	3 17	7 32	7 50	4 23	4 42	3 16	3 36	6 37	6 55	—	0 19	7 55	8 12	0 8	0 21	0 52	1 10	6 2	6 20	—	0 10	8 56	9 13	4 43	5 1
Tu	14	3 36	3 54	8 8	8 26	5 1	5 20	3 55	4 14	7 13	7 31	0 39	1 0	8 29	8 48	0 39	0 57	1 28	1 47	6 39	7 0	0 29	0 49	9 30	9 49	5 20	5 41
W	15	4 12	4 32	8 46	9 8	5 41	6 3	4 35	4 57	7 50	8 10	1 21	1 44	9 7	9 27	1 17	1 38	2 7	2 28	7 21	7 42	1 10	1 32	10 11	10 35	6 2	6 25
Th	16	4 52	5 14	9 31	9 55	6 26	6 51	5 21	5 47	8 30	8 53	2 7	2 30	9 47	10 7	2 0	2 23	2 50	3 12	8 4	8 26	1 56	2 21	11 2	11 33	6 48	7 13
F	17	5 38	6 4	10 21	10 50	7 18	7 48	6 14	6 43	9 19	9 47	2 51	3 19	10 28	10 53	2 47	3 13	3 36	4 2	8 51	9 17	2 47	3 15	—	0 9	7 40	8 9
S	18	6 31	7 1	11 24	—	8 22	8 59	7 16	7 52	10 17	10 50	3 46	4 15	11 22	11 54	3 43	4 17	4 31	5 2	9 46	10 18	3 46	4 21	0 49	1 31	8 41	9 16
S	19	7 34	8 9	0 2	0 38	9 37	10 15	8 30	9 10	11 27	—	4 45	5 17	—	0 30	4 54	5 34	5 35	6 11	10 55	11 33	4 58	5 34	2 14	3 53	9 53	10 32
M	20	8 45	9 27	1 13	1 47	10 51	11 25	9 46	10 19	0 7	0 46	5 50	6 24	1 7	1 43	6 15	6 53	6 47	7 24	—	0 9	6 8	6 40	3 28	3 57	11 10	11 45
Tu	21	10 1	10 37	2 20	2 52	11 57	—	10 50	11 19	1 24	1 53	6 58	7 32	2 19	2 55	7 37	7 57	7 57	8 30	0 44	1 19	7 11	7 42	4 22	4 46	—	0 17
W	22	11 9	11 40	3 22	3 51	0 26	0 53	11 46	—	2 32	3 3	8 3	8 32	3 31	4 5	8 25	8 53	9 0	9 29	1 52	2 23	8 13	8 42	5 9	5 32	0 48	1 16
Th	23	—	0 8	4 19	4 45	1 18	1 43	0 12	0 37	3 31	3 58	9 0	9 27	4 38	5 8	9 17	9 42	9 57	10 24	2 51	3 19	9 10	9 37	5 57	6 22	1 43	2 7
F	24	0 34	1 0	5 10	5 36	2 7	2 31	1 2	1 27	4 25	4 51	9 54	10 20	5 36	6 3	10 7	10 32	10 51	11 17	3 46	4 12	10 0	10 23	6 48	7 14	2 32	2 57
S	25	1 25	1 48	6 0	6 24	2 54	3 17	1 51	2 16	5 15	5 38	10 46	11 12	6 29	6 54	10 56	11 20	11 43	—	4 37	5 1	10 46	11 8	7 39	8 1	3 21	3 44
S	26	2 11	2 34	6 48	7 11	3 40	4 3	2 37	2 59	6 8	6 26	11 37	—	7 18	7 40	11 41	—	0 8	0 32	5 24	5 47	11 30	11 53	8 22	8 42	4 7	4 30
M	27	2 58	3 20	7 34	7 56	4 26	4 48	3 21	3 43	6 49	7 6	0 2	0 20	8 1	8 21	0 0	0 23	0 55	1 17	6 0	6 20	—	0 10	9 2	9 22	4 51	5 12
Tu	28	3 47	4 10	8 22	8 46	5 13	5 36	4 6	4 27	7 25	7 41	0 49	1 12	8 41	9 0	0 49	1 10	1 38	1 59	6 51	7 12	0 38	1 0	9 44	10 2	5 33	5 53
W	29	4 41	5 4	9 11	9 37	6 5	6 29	4 58	5 19	8 1	8 19	1 36	1 57	9 19	9 37	1 34	1 55	2 21	2 40	7 45	8 5	1 23	1 44	10 23	10 47	6 14	6 35
Th	30	5 33	5 56	9 59	10 24	6 57	7 21	5 50	6 12	8 41	9 0	2 16	2 37	9 54	10 14	2 11	2 31	3 0	3 21	8 43	9 3	2 7	2 30	11 10	11 30	6 57	7 19

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TIDAL CONSTANTS

For Various British, Irish, and European Ports.

By applying the Tidal Constant of the place, according to its sign (+ *add* — *sub.*), to the time of high water on the given day at the port of reference, you have the time of high water at the place sought.

Place.	Constant.	Port of Reference.
	H. M.	
Aberdeen	−1 17	Leith
Aberystwyth	−8 52	Liverpool
Alderney	+2 59	Brest
Antwerp	+5 18	Dover
Arbroath	−0 42	Leith
Arcachon	+0 50	Brest
Arklow	−2 25	Kingstown
Ayr	−0 18	Greenock
Banff	−1 49	Leith
Bantry harbour	−1 14	Queenstown
Barnstaple bridge	−0 26	Weston-s.-Mare
Bayonne	−0 2	Brest
Beachy head & Rye bay	+0 8	Dover
Beaumaris	−0 51	Liverpool
Belfast	+2 42	Londonderry
Berwick	−1 5	N. Shields
Blyth	−0 8	N. Shields
Bordeaux	+8 3	Brest
Boulogne	+0 18	Dover
Bridport	+0 23	Devonport
Bristol & King Road	+0 19	Weston-s.-Mare
Cadiz	−2 2	Brest
Caernarvon	−1 56	Liverpool
Calais	+0 37	Dover
Campbellton	−0 23	Greenock
Cardiff	+0 2	Weston-s.-Mare
Cardigan bar	−4 22	Liverpool
Carlingford bar	−0 10	Kingstown
Chatham	−0 47	London
Cherbourg	+4 2	Brest
Coleraine	−1 37	Londonderry
Coquet Road	−0 23	N. Shields
Cordouan Tower	−0 10	Brest
Cowes (West)	−0 27	Dover
Crinan	+4 41	Greenock
Cromarty	−2 21	Leith
Dartmouth	+0 33	Devonport
Deal & Downs	+0 8	Dover
Dieppe	+7 19	Brest
Donaghadee	+0 8	Kingstown
Donegal harbour	+0 17	Queenstown
Douglas & Ramsay	−0 11	Liverpool
Dublin bar	+0 2	Kingstown
Dundalk	−0 16	Kingstown
Dungeness	−0 27	Dover
Dunkerque	+0 56	Dover
Exmouth	+0 38	Devonport
Falmouth	−0 46	Devonport
Fecamp	+6 57	Brest
Ferrol	−0 47	Brest
Flamborough head	−1 59	Hull
Fleetwood	−0 12	Liverpool
Folkestone	−0 5	Dover
Fowey	−0 29	Devonport
Flushing	+1 42	Dover
Galway bay	−0 26	Queenstown
Gibraltar	−1 27	Brest
Glasgow (Port)	+0 10	Greenock
Gloucester	+2 51	Weston-s.-Mare
Granville	+0 26	Brest
Gravesend	−0 48	London
Grimsby (Great)	−0 53	Hull
Guernsey (St. Peter)	+2 50	Brest
Hartlepool	+0 5	N. Shields
Harwich	−1 52	London
Havre	+6 4	Brest
Helgoland	+0 21	Dover
Holyhead	−1 12	Liverpool
Holy Island harbour	−0 53	N. Shields
Honfleur	+5 42	Brest
Inverness	−1 59	Leith

Place.	Constant.	Port of Reference.
	H. M.	
Jersey (St. Helier)	+2 38	Brest
Kinsale	−0 18	Queenstown
Lerwick (Shetland)	−8 47	Leith
Limerick	+1 15	Queenstown
Lisbon Bar	−1 17	Brest
Littlehampton	+0 24	Dover
Llanelly bar	−0 38	Weston-s.-Mare
Lowestoft	−4 1	London
Lynn & Boston Deep	−0 29	Hull
Margate	−2 18	London
Maryport	+0 8	Liverpool
Milford Haven entr.	−0 58	Weston-s.-Mare
Montrose	−0 52	Leith
Morlaix	+1 6	Brest
Needles point	−1 26	Dover
Newcastle	+0 23	N. Shields
Newhaven	+0 39	Dover
Newport	+0 16	Weston-s.-Mare
Nieuport	+1 6	Dover
Nore	−1 28	London
Orfordness	−2 48	London
Oporto	−1 17	Brest
Ostende	+1 13	Dover
Padstow	−1 41	Weston-s.-Mare
Peel, Isle of Man	−0 15	Liverpool
Pembroke Dock	−0 42	Weston-s.-Mare
Penzance	−1 13	Devonport
Peterhead	−1 48	Leith
Piel harbour, Barrow	−0 18	Liverpool
Plymouth breakwater	−0 6	Devonport
Poole	−2 2	Dover
Port Carlisle	+0 47	Liverpool
Portland breakwater	+1 18	Devonport
Port Patrick	−0 58	Greenock
Portsmouth	+0 29	Dover
Ramsgate	−2 19	London
Rotterdam	+4 33	Dover
Santander	−0 17	Brest
Scarborough	+0 48	N. Shields
Selsea bill	+0 33	Dover
Sheerness	−1 21	London
Shoreham	+0 22	Dover
Sligo bay	+0 17	Queenstown
Southampton	−0 42	Dover
Spurn point	−1 8	Hull
St. Ives	−2 10	Weston-s.-Mare
St. Malo	+2 18	Brest
St. Mary (Scilly)	−1 16	Devonport
St. Nazaire	−0 7	Brest
Stornoway	+6 38	Greenock
Stromness (Orkneys)	−5 17	Leith
Sunderland	−0 1	N. Shields
Swansea bay	−0 53	Weston-s.-Mare
Tay bar	−0 11	Leith
Tees bar	+0 22	N. Shields
Tenby	−1 12	Weston-s.-Mare
Thurso	−5 49	Leith
Torbay	+0 17	Devonport
Tralee bay	−0 58	Queenstown
Ushant (Ouessant)	−0 15	Brest
Valentia harbour	−1 19	Queenstown
Waterford	+0 19	Queenstown
Westport	−0 4	Queenstown
Wexford	+2 20	Queenstown
Whitby	+0 22	N. Shields
Whitehaven	−0 9	Liverpool
Wick	−2 55	Leith
Wicklow	−0 41	Kingstown
Workington	−0 19	Liverpool
Yarmouth road	−4 43	London
Youghall	+0 18	Queenstown

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MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
364	English Channel—Owers Light-vessel	Altered in position.
365	England—East Coast—Shipwash	Intended alteration of fog-signal.
366	„ „ Tyne River—South Groyne	Intended new light.
367	Scotland—Peterhead—South Harbour	Closed pending improvements.
368	„ West Coast—Hebrides—Barra Head	Light altered.
369	„ „ Sound of Mull, Sgeir-na-Fennag Shoal	New buoy.
370	North Sea—Schelde River Entrance—Wielingen Channel	New light-vessel and alterations.
371	„ Hook of Holland Canal	Alterations in lights and tidal signals.
372	„ Jade River Entrance — Schillighörn	Permanent lights exhibited.
373	Baltic Entrance—Kattegat—Fiolskar	New lights.
374	„ „ Sound—Lappe Ground	Light and pilot vessel established.
375	„ Prussia—Greifswald Island	New harbour light.
376	„ Sweden—Utlangen Island	New light.
377	„ „ Roko Rock and Hufvudskär	New lights.
378	„ „ Approach to Stockholm	New lights and alterations.
379	„ Aland Islands—West Bogskar	New light established.
380	„ Gulf of Bothnia—Sweden—Hattbaden	Shoal discovered.
381	„ „ Sidby Fiard Entrance —Harr Ground	New fishing light.
382	White Sea—Arkhangel—North Dvina River Entrance	New light-vessel.
383	Spain—Cadiz—Las Puercas Rocks	Particulars of new light.
384	Mediterranean—Spain—Malaga	Extension of breakwater—decrease of depth of water.
385	„ „ Cape Palos	Discovery of shoals.
386	„ Adriatic—Brazza Island —Port Bol	New harbour light.
387	„ „ Lesina Island—Port St. Giorgio	New harbour light.
388	„ „ Narenta Channel —Gradac	New harbour light.
389	„ Archipelago — Mykoni Island—Tourla Bay—The Korpho	New harbour light.
390	„ Tunis—Tabarca Island	Light altered in colour.
391	Africa—West Coast—Gulf of Guinea—Prampram	Wreck on Vernon bank.
392	China Sea—Carimata Strait, &c.	Particulars of various shoals.
393	Australia—East Coast—Trinity Bay	Shoal south of Wentworth reef.
394	„ South Coast—Port Phillip Entrance	Tidal signals.
395	„ West Coast—Champion Bay	Intended alteration of colour of leading lights.
396	New Zealand — North Island — New Plymouth Harbour	Light altered in colour.
397	South America — Brazil — Imbituba — Batuba Point	New light.

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MONTHLY ABSTRACT OF NAUTICAL NOTICES—*Continued.*

No.	PLACE.	SUBJECT.
398	SOUTH AMERICA—Brazil—Santa Catharina Strait and Channel	New light and alterations.
399	SOUTH ATLANTIC OCEAN—Rocas Reef	Provisional light established.
400	WEST INDIES—Gulf of Mexico—Campeche Bank	Shoal S.E. of Alacran reef.
401	UNITED STATES—New Jersey—Elbow Beacon	Light changed in position.
402	„ Massachusetts—Gloucester Harbour Entrance	Character of light changed.
403	GULF OF ST. LAWRENCE—Nova Scotia—Merigomish Harbour—King Head	New light.

NAUTICAL NOTICES.

All Bearings Magnetic, unless otherwise stated.

364.—ENGLISH CHANNEL.—*Owers Light-Vessel.—Alteration in Position.*—In accordance with Notice p. 709, the Owers lightship has been moved 6 cables W. ¼ S. from her former position, and now lies in 16 fathoms at low water spring tides, with the following marks and bearings: Mixon beacon, touching the N.E. end of a low slated building next west of the High House on Selsea Bill, N.N.W. Nly.; Chichester cathedral and Pagham church spires in line, north; Eastborough head buoy, N.E. ¾ N. Nly., distant 3 miles; Boulder bank buoy, N.W. ½ W. Wly., distant 6 miles; Nab light-vessel, N.W. ¾ W., distant $12\frac{3}{10}$ths miles; South Spit of Outer Owers, N. by E. ¾ W., distant $\frac{6}{10}$ths of a mile; East extreme of shoal of the lead, N.E. by N., distant $1\frac{3}{10}$ths mile. *Variation*, 18° *W.*

365.—ENGLAND.—*East Coast.—Shipwash Light.—Intended Alteration of Fog-Signal.*—With reference to Notice 328, p. 786, when the alteration in the character of the Shipwash light takes place, the fog-signal will at the same time be altered, and will during foggy weather give three blasts in quick succession every two minutes, in the manner following, viz.: two low notes and a high note, each of two seconds' duration, at intervals of two seconds, followed by an interval of 110 seconds.

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366.—ENGLAND.—*East Coast.—Tyne River Entrance.—Intended Occulting Light on South Groyne.*—On or about 16th October, 1882, a light was exhibited from the Groyne on Herd sand, south side of Tyne river entrance. It is an *occulting* light, showing bright for *about eight seconds*, followed by an eclipse of two seconds—the occultations thus occurring *every ten seconds*. The light appears *white* between the bearings of W. ¼ N. and S.W. by W. ¾ W., and *red* between W. ¼ N. and N.W. by W. ¾ W. (or over the south pier and indicating the northern extremity of the submerged rubble base); it should be visible seaward from a distance of about 7 miles.

Note.—Approaching the river entrance with the high and low lights at North Shields in line, and when between the extremities of the piers, the Groyne light will bear West, S^{by}· (or about a point on the port bow), showing white, which colour must be kept in sight. When within the piers, open the leading lights a little to the southward, and when the Groyne light bears W. ¾ S. proceed with the lights on each bow till the Groyne light bears S. ¼ W., when a W. ¼ N. course may be steered into the harbour. *Variation*, 19½° *W.*

367.—SCOTLAND.—*East Coast.—Peterhead.—Discontinuance of South Harbour Light, and Closing of South Harbour.*—With reference to Notice in 1881, on the re-exhibition of South harbour light, and opening of South harbour, Peterhead, the Peterhead harbour authorities have given further Notice, that on 28th September, 1882, Peterhead South harbour light would be discontinued. Also, that on 28th September, 1882, and until further Notice, Peterhead South harbour would be closed to shipping, pending harbour improvements.

368.—SCOTLAND.—*West Coast.—Hebrides or Western Isles.—Bernera Island.—Alteration in Barra Head Light.*—The apparatus required for the alteration in Barra head light, Bernera island, having been completed, the new light will be exhibited on 17th October, 1882. It will be an *intermittent* white light, visible *thirty seconds*, and eclipsed *thirty seconds*; it will be visible round the horizon as far as the land will permit.

369.—SCOTLAND.—*West Coast.—Sgeir-Na-Fennag Buoy.*—

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Bunavulin Bay, Sound of Mull.—A six-foot can buoy, painted black, now marks the Sgeir-Na-Fennag shoal, on the south side of Bunavulin bay, sound of Mull. The buoy is moored off the West extremity of Sgeir-Na-Fennag shoal, in 3½ fathoms at low water spring tides, with the following marks and bearings, viz. :— Runa Gal lighthouse in line with Kingston Point, Ardnamurchan, N.W. by N. ½ N.; New School-House, Bunavulin, its own breadth open of the most western house in the village, N.E. by N.; Green island, a little open of Dunbane point, S. by E.

370.—North Sea.—*Schelde River Entrance.—Wielingen Channel.*—(1.) *Wandelaar Bank.—Intended Withdrawal of Buoy Lighted by Gas.*—With reference to Notice in 1881, on placing experimentally a buoy lighted by gas on Wandelaar bank, Wielingen channel, Schelde river entrance, further notice has been given that on the Belgian light-vessel *Wandelaar* being placed at her station on the bank, the buoy lighted by gas will be withdrawn.

(2.) *Intended Light-Vessel with Fog-Signal near Wandelaar Bank.* — In September, 1882, a light-vessel was placed about 3¾ cables S.W. by W. ½ W. from Wandelaar bank buoy. The light is a *flashing white* light, showing *one* flash *every five seconds*, elevated 34 feet above the sea, and visible from a distance of 11 miles. A riding light is also shown. The light-vessel (iron) painted red with black streak, and having the word *Wandelaar* in white letters on her sides, is moored in 5 fathoms at low water; by day, two baskets, coloured red and placed vertically, are carried at the masthead. Position, lat. 51° 22′ 15″ N., long. 3° 1′ 15″ E. Also, a *fog-signal* is established on board Wandelaar bank light-vessel. The signal is a siren, which, during thick or foggy weather, will give *two* short blasts in succession *every two minutes*. Should it not be possible to work the siren, a bell will be sounded *twice* in succession *every two minutes*.

Note.—When from any cause the flashing light cannot be exhibited, a fixed white lantern light will be shown from the masthead, and a white flare every ten minutes from above the gunwale. When the light-vessel is not at her station, the usual lights will not be exhibited, but three fixed lantern lights (upper white and

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the others red), placed vertically, will be shown. By day a red flag will be hoisted at the masthead. Should the light-vessel be in need of assistance, the signal flags N. C. of the International Code, "*In danger, have need of help,*" will be hoisted; and at night, in addition to the above-mentioned lights, a fixed white light will be shown from the stern.

(3.) *Wielingen Light-Vessel.—Intended Alteration in Position.*—On the light-vessel *Wandelaar* being placed at her station, the Wielingen light-vessel was moved in position 2½ miles E. ¾ S. The light shows a *red* flash of *fifteen seconds'* duration *every half-minute*, elevated 39 feet above the sea, and visible from a distance of 9 miles. A riding light is also shown. The light-vessel is moored in 5 fathoms at low water, with Niewe Sluis lighthouses in line, and Brugge and Heijst church towers in line. The light apparatus is on the mainmast; by day a red ball is carried at the masthead; the vessel also has a jigger-mast. Position, lat. 51° 23′ 20″ N., long. 3° 14′ 30″ E. *Variation*, 16½° *W.* During thick or foggy weather a bell is sounded continuously.

Note.—When from any cause the flashing light cannot be exhibited a fixed red lantern light will be shown from the masthead, and a white flare every five minutes from the gunwale. When the light-vessel is not at her station, the usual lights will not be exhibited, but three fixed lantern lights (upper red and the others white), placed vertically will be shown. Should the light-vessel be in need of assistance, in addition to the above-mentioned lights, a fixed white light will be shown from the stern.

371.—North Sea.—*Hook of Holland Canal.—Alterations in Lights and Tidal Signals.*—With reference to Notice in February, 1882, on the exhibition of two additional leading lights to indicate the channel of the bar of the West gat, Hook of Holland canal entrance, further notice has been given that the following alterations will be made in the lights at the canal entrance:—The red light on the South mole will be discontinued. The coloured leading lights for West gat will be altered in colour, as follows:—The western leading lights (K, L) will be *fixed red* lights instead of fixed green; the high or eastern light is visible seaward through

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an arc of 180°, or between the bearings of N.E. and S.W.; the low or western light is visible seaward between the bearings of N.E. and S.E. by E. ½ E. (over the position of the outer red buoy). The eastern leading lights (C, D) will be *fixed green* lights instead of fixed red. Also, the depths in the West gat, canal entrance, will be signalled, so that when navigating in the Noord gat, it should be borne in mind that there will be 3 feet less water than indicated by the signal. *Variation*, 16¼° *W.*

372.—North Sea.—*Jade River Entrance.—Schillighörn.—Re-Exhibition of Permanent Lights, and Discontinuance of Provisional Light.*—With reference to Notice 155, p. 384, on discontinuance of the permanent lights, and exhibition of a provisional light, pending the completion of the new lighthouse, at Schillighörn, west side of Jade river entrance, further Notice has been given that the lighthouse has been re-erected (without alteration in appearance); also, that the permanent lights are re-exhibited, and the provisional light discontinued. The upper light is a *fixed red* light, elevated 69 feet above high water, and visible between the bearings of S. 9° W. (through south) and S. 52° W. from a distance of 12 miles; and between S. 52° W. (through west) and N. 30¾° W. from a distance of 9 miles. The lower (leading) light is a *fixed white* light, elevated 59 feet above high water, and visible between the bearings of N. 25½° W. and N. 30¾° W. from a distance of 11 miles. This light is only visible in the channel between buoys P. and No. 10, and R. and No. 12, becoming dimmer and disappearing on either side of these limits; it attains its greatest brilliancy nearly in the direction of mid-channel. Position, lat. 53° 42′ 20″ N., long. 8° 1′ 30″ E.

373.—Baltic Entrance.—*Kattegat.*—*Kongsbacka Fiord Entrance.—Lights on Fiolskär.*—On 1st October, 1882, two lights would be exhibited on Fiolskär (Fjordskär), Kongsbacka (Kungsbacka) fiord entrance. The outer light shows a *flashing white* light with *two flashes* seaward between the bearings of N. 5° W. and N. 14° E.; a *fixed white* light between N. 14° E. and N. 40° E; and a *flashing red* light with *one flash* from N. 40° E. to N. 52° E. The inner light is a *fixed* light, showing *red* between the bearings of S. 20° W. and S. 30° W.; and *white* from S. 30° W. to

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S. 34° W., in the direction of Kongsbacka fiord. Both lights are elevated 29 feet above the sea. They will only be discontinued when Kongsbacka fiord is closed by ice. Position, lat. 57° 21′ 0″ N., long. 12° 1′ 30″ E. *Variation*, 12° *W.*

374.—Baltic Entrance.—*The Sound.—Light and Pilot-Vessel with Fog-Signal Northward of Lappe Ground.*—With reference to Notice 298, p. 710, on the intended placing of a light and pilot vessel northward of Lappe ground, at the northern entrance to the Sound, the light and pilot vessel has been placed in position. The light is a *white double flashing minute* light, showing two successive flashes of *about two and a-half seconds'* duration, divided by an eclipse of about *nine seconds*, the second flash being followed by an eclipse of about *forty-six seconds*. The light (exhibited from the foremast) is elevated 30 feet above the sea, and should be visible from a distance of about 10 miles. A riding light is also shown from the forestay, 6 feet above the rail. The vessel, painted red with a white cross, bearing the name *Lappegrunden*, carrying a red globe at foremast head, is moored in about 11 fathoms water, about 2½ cables N. ¼ W. from the red conical buoy with red staff and globe, marking the north extreme of Lappen sound. Position, lat. 56° 4′ 5″ N., long. 12° 36′ 30″ E. Also a fog-signal is established at Lappe ground light-vessel. It is a steam-siren, which, during thick or foggy weather, will give *two blasts* in quick succession *every minute*.

Note.—Elsinore sea and harbour pilots may be obtained from this light-vessel, which will, when the ice allows, be kept at her station throughout the year—the light will be exhibited in accordance with other Danish lights. *Variation*, 11¼° *W.*

375. — Baltic. — *Prussia. — Harbour Light on Greifswald Island.*—A harbour light is now exhibited on the north mole head of the refuge harbour for fishermen at Greifswald island; it is a *fixed red* light, elevated 23 feet above the sea. Position approximate, lat. 54° 15′ N., long. 13° 55′ 20″ E. This light will be shown annually from 15th March to 1st December, except when the harbour is closed by ice.

376.—Baltic.—*Sweden.—Light on Utlängan Island.*—With reference to Notice in 1881, on intended exhibition of a light from a

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building on the south extreme of Utlängan island, eastern side of approach to Carlskrona, the light has been exhibited. It is a *fixed* light, showing *white* between the bearings of S. 54° W. (through west) and N. 27° W.; *red* between N. 27° W. (through north) and N. 59° E.; and white between N. 59° E. (through east) and S. 54° E. It should be visible in clear weather from a distance of 8 miles. Position, lat. 56° 1′ 0″ N., long. 15° 47′ 30″ E. *Variation*, 9° *W.*

377.—Baltic.—*Sweden.*—(1.) *Light on Röko Rock.*—On 16th August, 1882, a light was exhibited on Röko (Rodko) rock, southern channel to Södertelje, about 4 miles N.W. by N. from Landsort lighthouse. It is an *intermittent white* and *red* light. Position approximate, lat. 58° 47′ 20″ N., long. 17° 47′ 15″ E.

Note.—This light will be discontinued on 15th December, 1882, for the winter.

(2.) *Light on Hufvudskär.*—On 1st October, 1882, it is intended to exhibit a light on Hufvudskär. It will be a *fixed and flashing white* light, showing a flash *every two minutes*, visible in clear weather from a distance of 14 miles. Position, lat. 58° 58′ 15″ N., long. 18° 34′ 30″ E.

378.—Baltic.—*Sweden.—Stockholm Approach.*—(1.) *Light on Söderhall Rock.*—A leading light is now exhibited on Söderhäll rock, in the channel between Landsort and Dalarö, approach to Stockholm: it is an *intermittent white* and *red* light. Position approximate, lat. 59° 0′ 45″ N., long. 18° 15′ 30″ E.

Note.—Vessels must pass eastward of this light.

(2.) *Light on Lilla Rotholm.*—A leading light is now exhibited on Lilla Rotholm, in the channel between Landsort and Dalarö, approach to Stockholm: it is an *intermittent white* and *red* light. Position approximate, lat. 59° 4′ 20′ N., long. 18° 20′ 30′ E.

(3.) *Light near Stendörren.*—A leading light is now exhibited on the south point of the central rock of Stenkäringen, between Stendörren and Ramnö, approach to Stockholm: it is a *fixed white* and *red* light, showing *white* in the channel from the wooden posts southward of Grönö towards Römnö sound; *red* southward of Römnö sound; to the northward of Römnö sound the light is obscured. Position approximate, lat. 59° 11′ N., long. 18° 30′ E.

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(4.) *Light on Langöhlm.*—A leading light is now exhibited on the S.W. point of Länghölm, in the channel between Dalarö and Kanholm fiärd, approach to Stockholm: it is an *intermittent white* and *red* light. Position approximate, lat. 59° 18′ 15″ N., long. 18° 45′ 0″ E.

(5.) *Light on Yxhammarkubb.*—A leading light is now exhibited on the N.E. point of Yxhammarkubb, in the channel between Sandhamn and Kanholm fiärd, approach to Stockholm: it is an *intermittent white* and *red* light. Position approximate, lat. 59° 19′ N., long. 18° 48′ E.

(6.) *Light at Faklubben.*—A leading light is now exhibited at Faklubben, near Gälnoport, approach to Stockholm: it is an *intermittent white* and *red* light. Position approximate, lat. 59° 23′ 30″ N., long. 18° 38′ 0″ E.

Note.—The above-mentioned lights will be shown annually from 1st August to 15th December.

(7.) *Light on Brödstycket Rock.*—A leading light is exhibited on Brodstycket rock, in the Träl Hafvet, approach to Stockholm: it is an *intermittent white* and *red* light. Position approximate, lat. 59° 26′ 45″ N., long. 18° 23′ 30″ E. The light will be shown annually from 1st August to 15th December.

(8.) *Alteration in Sandhamn Light, and Discontinuance of Korsö Islet Light.*—With reference to Notice 228, p. 552, on intended discontinuance of Korsö islet light, and alteration in Sandhamn light, Sandhamn entrance to Stockholm. On 22nd August, 1882, a new light was exhibited (in lieu of the two lights) at Sandhamn, and Korsö islet light was discontinued. The light is visible through an arc of 20°, showing a *flashing red* light with *one flash* between the bearings of N. 39° W. and N. 46½° W.; a *fixed white* light between N. 46½° W. and N. 49° W.; and a *flashing white* light with two *flashes* between N. 49° W. and N. 59° W. It is elevated 33 feet above the sea, and visible from a distance of 10 miles. *Variation*, 7° *W.*

879.—Baltic.—*Aland Islands.—Light on West Boyskär.*—With reference to Notice 261, p. 634, on the intended exhibition during the Autumn of 1882, of a light from a lighthouse then in course of construction on the western Bogskär rock, southern approach to

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Aland islands, the light is now exhibited. It is a *flashing white* light, showing *four white flashes every minute*, each flash being of about *fifteen seconds'* duration. The lighthouse is situated on the western rock of the Bogskär (Bokeher) group. Position, lat. 59° 30′ 15″ N., long. 20° 21′ 0″ E. Further particulars in due course.

380—BALTIC.—*Gulf of Bothnia.—Sweden.—Shoal N.E. of Hattbäden.*—Lying about 2¼ miles N.E. of Hattbäden, northern side of Iggö island. This shoal, about six cables in extent, has a least depth of 3 fathoms over it, with 6 to 15 fathoms around. Position (shoalest spot), lat. 60° 55′ 45″ N., long. 17° 21′ 30″ E. *Variation*, 8¾° *W.*

381.—BALTIC.—*Gulf of Bothnia.—Sidby Fiärd Entrance.—Fishing Light on Harr Grund.*—On 10th August, 1882, a fishing light would be exhibited from a pole on Harr grund, Sidby (Sideby) fiärd entrance. It is a *fixed white* light, elevated 19 feet above the sea. Position approximate, lat. 61° 59′ 10″ N., long. 21° 17′ 30″ E. This light will be shown annually from 10th August to 1st October.

382.—WHITE SEA.—*Arkhangel Bay.—Intended Light-Vessel at North Dvina River Entrance.*—It is intended to place a light-vessel, exhibiting two lights, in the approach to the New bar, North Dvina river entrance, Arkhangel bay. The lights will be—*fixed white* on one mast, and *fixed red* on the other. The light-vessel will be moored in 6 fathoms with the lighthouses on the south end of Mudovski (Moudiuga or Moudiough) island in line, 2 miles from the beacon buoy with flag. Position, lat. 64° 56′ 0″ N., long. 40° 9′ 10″ E. Further particulars will be published.

383.—SPAIN.—*Cadiz Bay.—Particulars of Las Puercas Rocks Light.*—With reference to Notice 300, p. 711, on the exhibition of an *occulting* white light from the beacon lighthouse on the west extreme of Las Puercas rocks, Cadiz bay, the light is visible *ten seconds*, and eclipsed *twenty seconds*. It was previously stated "eclipsed ten seconds."

384.—MEDITERRANEAN.—*Spain.—Port Malaga.—Extension of Breakwater, Decrease in Depth of Water.*—With reference to Notice in 1881, on the extension of the breakwater at port Malaga, the breakwater works at that port have been extended

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a distance of 295 yards, or about one-fourth of the proposed length. Also the depth of water at the entrance of the port has decreased, and vessels of more than 18 feet draught should not attempt to enter.

385.—MEDITERRANEAN.—*Spain.—Shoals in the Vicinity of Cape Palos.*—Two shoals have been discovered in Hormigas channel, between cape Palos and Las Hormigas. (1.) A shoal consisting of a small cluster of pinnacle rocks, having a least depth of 27 feet on it, with 11 to 19 fathoms around, lying with the extremity of cape Palos bearing W. by S., distant 4½ cables. (2.) A shoal, of small extent, with least depth on a pinnacle rock of 6 fathoms, and 7 to 10 fathoms around, lies with the extremity of cape Palos, bearing W. by S. ½ S., distant 6 cables. There is a depth of 14 fathoms between these shoals, which are about half a cable apart.

Note.—Vessels using Hormigas channel should pass between Hormiga Chica, and the bank (de Dentro) about half a mile S.W. of it. *Variation*, 16¼° *W.*

386. — MEDITERRANEAN. — *Adriatic. — Brazza Island. — Harbour Light at Port Bol.*—A harbour light is exhibited from an iron standard on the extremity of the wall of the parapet of the great mole at port Bol, south side of Brazza island. It is a *fixed red* light, elevated 16 feet above high water (15 feet above the ground), and visible from a distance of 8 miles. Position approximate, lat. 43° 15′ 40′ N., long. 16° 39′ 35″ E.

387.—MEDITERRANEAN. — *Adriatic. — Lesina Island. — Harbour Light at Port St. Giorgio.*—A harbour light is exhibited from an iron standard on the stone column of the mole head at port St. Giorgio, eastern end of Lesina island. It is a *fixed white* light, visible through an arc of 300°, or between the bearings of E. by N. ¾ N. and S.E. ½ E.; elevated 15 feet above high water (14 feet above the ground), and visible from a distance of 8 miles. Position approximate, lat. 43° 7′ 30″ N., long. 17° 11′ 30″ E. *Variation*, 9° *W.*

388.—MEDITERRANEAN.—*Adriatic.—Narenta Channel.—Harbour Light at Gradac.*—A harbour light is exhibited from an iron standard on the stone column of the mole head at Gradac

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(Gradaz), eastern side of Narenta channel. It is a *fixed white* light, elevated 14 feet above high water, and visible from a distance of 3 miles. Position approximate, lat. 43° 6′ 20″ N., long. 17° 20′ 30″ E.

389.—MEDITERRANEAN.—*Archipelago.—Mykoni Island.—Tourla Bay.—Harbour Light in the Korpho.*—On September 13, 1882, a harbour light would be exhibited from a mast, 16 feet high, at the extremity of the jetty on the east side of the Korpho, port of Mykoni (Myconos). It is a *fixed red* light, visible through an arc of 72°, or between the bearings of S. 16½° E. and S. 88½° E.; elevated 23 feet above the sea, and visible for a distance of 4 miles. Position, lat. 37° 26′ 5″ N., long. 25° 20′ 10″ E. *Variation*, 6½° *W.*

390.—MEDITERRANEAN.—*Tunis.—Tabarca Island Light.—Alteration in Colour.*—The light exhibited on the N.W. point of Tabarca island has been altered from a fixed white light to a *fixed red* light.

391.—AFRICA.—*West Coast.—Gulf of Guinea.—Prampram.—Wreck on Vernon Bank.*—The wreck of the American barque *Sarah E. Kingsbury*—destroyed by fire on August 7, 1882, while at anchor in the road off Prampram—lies in a position dangerous to shipping on Vernon bank, in 3¼ feet at low water, with the following bearings and distance:—Houses on Prampram beach, N. 5° W., distant about 2¼ miles; ruin of Great Ningo fort, N. 52° E. These bearings place the wreck in approximately, lat. 5° 40′ 0″ N., long. 0° 8′ 45″ E. *Variation*, 17½° *W.*

392.—CHINA SEA.—*Carimata Strait.*—(1.) *Sunken Rocks Northward of Papan Islands.*—The Netherlands Government surveying vessel *Hydrograaf*, reports the existence of two sunken rocks lying about 4 miles northward of the western islets of the Papan group:—(1.) This rock (*Rob Roy Rock*), of coral formation, is 54 yards in diameter, with 15 feet water over it; on the north and west sides, the depths increase suddenly to 10 and 12 fathoms; on the S.E. side, at the distances of quarter and half a cable, to 6 and 8 fathoms, over sand and stone. The water on this rock was not discoloured, nor did it break. Position, lat. 1° 29′ 10″ S., long. 109° 20′ 55″ E. (2.) This rock (*Kate rock*),

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composed of stone, is about 330 yards long in an E.S.E. and W.N.W. direction, and 160 yards in breadth, with 7 feet water over it, and 12 to 14 fathoms around, bottom sand and mud The water on this rock was not discoloured, but it was indicated by a slight ripple and eddies. Position, lat. 1° 29′ 5″ S., long. 109° 19′ 40″ E., or, about one mile westward of Rob Roy rock.

(2.) *Spirit of the North Shoal.—Unsuccessful search for.*—Also, that Spirit of the North shoal, Papan group, was unsuccessfully searched for—its position therefore must be considered doubtful.

(3.) *Sunken Rock eastward of Goerong Islands.*—Also, of the existence of a sunken rock lying about 5 cable eastward of the easternmost of the Goerong (Passage) islands. This rock, of coral, is about 160 yards in extent with 7 feet water over it, and 12 to 14 fathoms around, bottom sand and mud. There was a slight ripple on this rock, but the water was not discoloured. Position, lat. 1° 27′ 50″ S., long. 109° 13′ 25″ E.

393.—AUSTRALIA.—*East Coast.—Trinity Bay.—Shoal Southward of Wentworth Reef.*—Lying about 3½ miles southward of Wentworth reef, Trinity bay. This shoal *(Corea shoal)*, reported by the commander of the steam-vessel *Corea*, is stated to be about one cable in extent, with 4 to 6 feet over it at low water spring tides, lying with the following bearings:—White cliffs, S. by E. ¼ E.; Harris peak, S.W. by S.; Island point, N.W. ¼ W. Position, lat. 16° 34′ 0″ S., long. 145° 35′ 15″ E. *Variation*, 6¼° *E.*

394.—AUSTRALIA.—*South Coast.—Port Phillip Entrance.—South Channel.—Tidal Signals at Pile Lighthouse.*—On 24th July, 1882, the following tidal signals would be exhibited from Pile lighthouse, South channel, port Phillip entrance—indicating the depth of water in the deepest or northern side of the channel, in the vicinity of Pile lighthouse. *From Sunrise to Sunset.*—One blue flag, 25 ft.; one ball, 25 ft. 6 in.; one ball with blue flag over, 26 ft.; one ball with blue flag under, 26 ft. 6 in.; two balls, 27 ft.; two balls with red flag under, 27 ft. 6 in.; two balls with red flag over, 28 ft.; two balls with red flag between, 28 ft. 6 in.; one red flag, 29 ft. *From Sunset to Sunrise.*—One green light,

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25 ft.; one white light, 25 ft. 6 in.; one white light with green light over, 26 ft.; one white light with green light under, 26 ft. 6 in.; two white lights, 27 ft.; two white lights with red light under, 27 ft. 6 in.; two white lights with red light over, 28 ft.; two white lights with red light between, 28 ft. 6 in.; one red light, 29 ft.

395.—AUSTRALIA.—*West Coast.—Champion Bay.—Intended Alteration in Colour of Leading Lights.*—On 1st November, 1882, the following alteration will be made in the colour of the leading lights exhibited on the northern side of Champion bay. The lights will be *fixed white* lights, instead of fixed red as at present.

396.—NEW ZEALAND.—*North Island.—West Coast.—New Plymouth Harbour Light.—Alteration in Colour.*—On 1st August, 1882, the following alteration would be made in the colour of the harbour light exhibited from the flagstaff on mount Elliott, New Plymouth (Taranaki). The light is now a *fixed red* light, instead of fixed white as previously, elevated 75 feet above the sea, and visible seaward, except where obscured by Sugar Loaf islands, from the bearing of E. by N. to the land in the direction of Waitera (Waitara). *Variation*, 15¾° *E.*

397.—SOUTH AMERICA.—*Brazil.—Imbituba.—Light on Batuba Point.*—On 9th August, 1882, a light was exhibited on Batuba point, near Imbituba anchorage. It is a *fixed white* light, visible seaward between the bearings of S.E. and N.E.; elevated 69 feet above the sea, and visible from a distance of 10 miles. The light is shown from an iron standard, 20 feet high; the keeper's dwelling near it is painted white. Position approximate as given, lat. 28° 16′ 45″ S., long. 48° 40′ 20″ W. *Variation*, 1¾° *E.*

398.—SOUTH AMERICA.—*Brazil.—Santa Catharina Island.*—(1.) *Intended Light on Arvoredo Islet.*—A light will shortly be exhibited from a lighthouse erected on South point, Arvoredo islet, north channel to Santa Catharina strait: The light will be elevated about 350 feet above the sea: The lighthouse, circular in shape, is painted red, the dwellings adjoining are white. Position approximate, lat. 27° 18′ S., long. 48° 22′ W.

(2.) *Anhatomirim Islet Light.—Alteration in Colour.*—The light

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exhibited on Anhatomirim islet, Santa Catharina strait, is a *fixed red* light, visible to the eastward through an arc of 112°, and should be seen from a distance of four miles. The lighthouse, a low square building, painted white, is situated on the S.W. summit of the islet.

399.—South Atlantic Ocean.—*Provisional Light on Rocas Reef.*—With reference to Notice in 1881, on the intended exhibition of a light from an iron lighthouse to be erected on Rocas reef, situated 130 miles to the N.E. of cape St. Roque, east coast of Brazil, further notice has been given that pending the completion of the lighthouse, a provisional light would shortly be exhibited. The light, shown from a mast 49 feet high, will be a *fixed white* light, visible from a distance of 9 miles. The mast is placed on the north island of the reef, about one mile from its north-western edge. Position approximate, lat. 3° 51′ 30″ S., long. 33° 49′ 0″ W.

400.—West Indies.—*Gulf of Mexico.—Campeche Bank.—Shoal South-East of Alacran Reef.*—On Campeche (Yucatan) bank, lying about 33 miles S.E. of the southern edge of Alacran reef. This shoal (*Granville shoal*), over which the *Dallam Tower* passed, obtaining a least depth of 4½ fathoms, is composed of sand, broken coral, and small stones (apparently volcanic); the sea broke heavily over the shoalest part, and the soundings increased gradually to 6, 7, 9 and 11 fathoms, thence suddenly deepening to 20 fathoms. Position from reliable astronomical observations, lat. 21° 54′ 30″ N., long. 89° 19′ 10″ W. On the same authority it is reported that a shoal patch of 7 fathoms exists about 10 miles to the northward of Granville shoal.

Note.—The above position of Granville shoal has also been verified by the commander of the steam-vessel *Mariner*.

401.—United States.—*New Jersey.—Elbow Beacon Light.—Change of Position.*—On and after October 1, 1882, the light now known as the Elbow beacon, mouth of Passaic river, New Jersey, will be shown from the end of the Government dike, about 850 feet N.E. ½ N. from its present position. The light will be *fixed red*.

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402.—UNITED STATES.—*Massachusetts.—Gloucester Harbour Entrance.—Change of Characteristic of Eastern Point Light.*—On and after October 1, 1882, the light shown from eastern point lighthouse, entrance to Gloucester harbour, Massachusetts, will be altered to a *red flashing* light, instead of *fixed red*, as formerly. The interval between the flashes will be 5 seconds.

403.—GULF OF ST. LAWRENCE.—*Nova Scotia.—Merigomish Harbour—Light on King Head.*—On 1st September, 1882, a light would be exhibited from a lighthouse erected on King head, west point of entrance to Merigomish harbour; it is a *fixed red* light, elevated 105 feet above high water, and visible from a distance of about 10 miles. The lighthouse, 40 feet high, is a square wooden tower, and with keeper's dwelling attached, is painted white. Position, lat. 45° 39′ 20″ N., long. 62° 28′ 30″ W.

SIGNAL AND TELEGRAPH STATION AT VINGA (SWEDEN).—The Swedish authorities have arranged that Mariners passing Vinga may be made acquainted, through the signal and telegraph station there, with the telegraphic information received at the station, every day after 8 a.m., as to the direction and force of the wind, and the direction of the current in the Northern and Southern parts of the Sound, and at the Skaw in the Cattegat, and at Oxo in the Skagerrack. This information will be conveyed free of charge, whether it be requested and received (*a*) by signal between the vessel and the signal station, (*b*) by verbal communication at the station, when a boat has been sent to shore for the purpose, or (*c*) through the pilot, when such an one has been applied for. Mariners may also obtain, through the signal and telegraph station at Vinga, similar information as to the state of the wind and current at any place in the Kingdom where there is both a Government telegraph station and a pilot station. Such information, however, will be subject to the usual charge for the conveyance by the telegraph lines, and for signalling between Vinga and the vessel.

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Official Inquiries at Home, 1882.

1483. *King Coal*, s.s.; built at North Shields, 1871; owned by Mr. E. Eccles and others; tonnage, 562; the Tyne to Hamburg; coals; lost on Vogel Sand, August 5, 1882. Inquiry held at North Shields, August 24, 1882, before John and Joseph Spence, Justices; Parish and Hyde, N.A. Master to blame for passing to northward of Elbe Lightship instead of as laid down in Sailing Directions, but in consideration of gale blowing and removal of pilot gallote, certificate not dealt with.

1484. *Ravenstondale*, ship; built at South Shields, 1874; owned by Mr. R. B. Avery; tonnage, 1,174; Cardiff to Singapore; coals; and thence to Chittagong; damaged by explosion of donkey boiler, January 25, 1882, when loss of life ensued. Inquiry held at North Shields, September 8, 1882, before Jackson and Swan, Justices; Wilson and Murdoch, N.A. Accident occasioned by the wasted and thin condition of the boiler-plates caused by corrosion. Master censured for not periodically examining the said boiler and seeing that it was in good and serviceable repair.

1485. *Labarrouère*, s.s.; built at Jarrow-on-Tyne, 1880; owned by Labarrouère Steamship Company; tonnage, 772; Cardiff to St. Nazaire; coals; stranded on Le Four Reef, Island of Molene, August 7, 1882. Inquiry held at North Shields, August 28, 1882, before Cleugh and Hedley, Justices; Harland and Methven, N.A. Master guilty of negligent navigation. Certificate suspended for six months; recommended for one as mate during that time.

1487. *Lake Nepigon*, s.s.; built at Govan, 1875; owned by Canada Shipping Company; tonnage, 1,438; Liverpool to Quebec; general cargo and passengers; stranded on Irish Coast, September 1, 1882. Inquiry held at Liverpool, September 16, 1882, before Raffles, Judge; Parfitt and French, N.A. No serious damage proved.

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1508. *Adventure*, cutter, and *Woodstock*, s.s.; the former built at Rochester, 1801; owned by Mr. W. H. Brown, and another; tonnage, 51; on a fishing cruise; the latter built at Leith, 1880; owned by Messrs. Gibson and Somerville; tonnage, 376; Ghent to Leith; general cargo; in collision off Flamborough Head, August 17, 1882, when the *Adventure* foundered and loss of life ensued. Inquiry held at Leith, September 20, 1882, before McIntosh and Wilson, Justices; Anderson and Kennedy, N.A. Mate of *Woodstock* in default for keeping a bad look-out, and for porting instead of starboarding his helm on seeing the fishing boat's light. His master's certificate suspended for twelve months.

1509. *Dordogne*, schooner, and *Lara*, s.s.; the former built in France, 1849; owned by Mr. S. Roches; tonnage, 54; Cardiff to Ireland; coals; the latter built at Waterford, 1868; owned by the Waterford Steamship Company; tonnage, 475; Waterford to Bristol; cattle, &c.; in collision, July 11, 1882, since which the schooner has not been heard of. Inquiry held at Bristol, September, 2, 1882, before Pethick and Edwards, Justices; Parfitt, Burney, Anderson, N.A. No sufficient reason for dealing with certificates of master and mate of *Lara*.

1514. *Rotterdam*, s.s.; built at Dumbarton, 1856; owned by Mr. C. Coverley and others; tonnage, 398; Newport (Mon.) to Oporto; coals; lost on Cape Torifiana, August 21, 1882. Inquiry held at Westminster, September 29, 1882, before Rothery, Wreck Commissioner; Forster and Davies, N.A. Casualty caused by a strong Atlantic current carrying ship to eastward of her course, and for which the master made no allowance. Certificate not dealt with in consequence of excellent character, and previous immunity from accident.

1515. *Brighton*, s.s., built at North Shields, 1878; owned by Mr. W. S. Gardner; tonnage, 33; Brighton to Eastbourne; passengers; stranded on Beachy Head, September 8, 1882. Inquiry held at Westminster, September 29, 1882, before Rothery, Wreck Commissioner; Ronaldson and Vaux, N.A. Accident caused by going too close in shore whilst rounding Beachy Head. Master's certificate not dealt with.

1516. *Arethusa*, barque; built at Bathurst, N.B., 1854; owned

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by Mr. W. Harland; tonnage, 339; Liverpool to Quebec; coals; stranded and lost off Blackpool, August 21, 1882. Inquiry held at Liverpool, October 5, 1882, before Raffles, Judge; Wilson and French, N.A. Ship lost through the wrongful acts of both master and mate, and from their inability to navigate the vessel from drunkenness. Certificates cancelled.

1518. *Adonis*, s.s.; built at Barrow, 1874; owned by Mr. W. McLeod; tonnage, 253; Marseilles to Hamburg; oilcake, phosphates, &c.; stranded at Point Sagres, and subsequently abandoned, August 30, 1882. Inquiry held at Middlesborough, October 4, 1882, before Coleman, Judge; Comyn and Anderson, N.A. Master in default for negligent navigation, and for prematurely abandoning his ship. Certificate suspended for four months.

1521. *Rowland Evans*, brig; built at Derwenlas (Montgom.), 1865; owned by Mr. J. Evans and others; tonnage, 208; Antwerp to Garstang; silver sand; abandoned near Bardsey Island, September 12, 1882. Inquiry held at Swansea, October 9, 1882, before Fowler, Judge; Beasley and Harland, N.A. Master to blame for premature abandonment, and for attempting to scuttle the brig. Certificate suspended for 12 months; mate censured for not protesting against master's proceedings.

Official Inquiries Abroad, 1881-2.

1478. *Lillian*, ketch; sprung a leak and subsequently beached. Inquiry held at Sydney, July 10, 1882. Master in default for not reporting condition of vessel to owner. Censured.

1479. *Strathspey*, barque; lost on Buie Rocks, Valparaiso Harbour, July 17, 1882. Naval Court held at Valparaiso, July 21, 1882. Loss caused through wind failing and vessel drifting on rocks. Master should have let go his anchor. Censured.

1481. *Alice*, barque; lost off Maké, June 10, 1882. Inquiry held at Calicut, July 10, 1882. Master free from blame.

1482. *Bridgetown*, barque; lost near Port Natal, June 28, 1882. Inquiry held at Port Natal. Master on shore at time of casualty. Mate should have made sail and gone to sea. Certificates returned.

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1486: *Colombo*, barque; burnt at sea, May 18, 1882. Inquiry held at Singapore, July 20, 1882. Fire due to spontaneous combustion.

1488. *Argomene*, ship; *Bombay*, tug; in collision at Sandheads, River Hooghly, June 26, 1882. Inquiry held at Calcutta, July 22, 1882. Casualty purely accidental.

1489. *Noura*, schooner; grounded on Mallacoota Point, June 16, 1881. Inquiry held at Melbourne, September 2, 1881. Master free from blame.

1490. *Miranda*, schooner; lost in Apollo Bay, August 16, 1881. Inquiry held at Melbourne, August 26, 1881. Master exonerated.

1491. *Alert*, s.s., and *Taniwha*, yacht; in collision, April 2, 1881. Inquiry held at Melbourne, April 22, 1881. Both vessels equally to blame.

1492. *Cheviot*, s.s.; *Nelson*, s.s.; in collision in River Tarra, May 3, 1881. Inquiry held at Melbourne, May 17, 1881. Neither vessel to blame.

1493. *Paynesville*, s.s.; lost on Ninety Mile Beach, March 20, 1881. Inquiry held at Melbourne, April 7, 1881. Master not in default.

1494. *Caroline*, ketch; Lost in Port Phillip Bay, May 9, 1881. Inquiry held at Melbourne, May 13, 1881. No blame attached to master.

1495. *Edward Vittery*, schooner; lost on Tristan D'Acunha Island, March 8, 1881. Inquiry held at Melbourne, May 16, 1881. Driven ashore from anchorage by heavy sea.

1496. *Pretty Jane*, s.s.; grounded at the Lake's entrance, September 15, 1881. Inquiry held at Melbourne, October 14, 1881. Master exonerated from blame.

1497. *Isabella*, schooner, and *Naramissic*, lighter; in collision in Hobson's Bay, May 12, 1882. Inquiry held at Melbourne, May 19, 1882. Casualty purely accidental.

1498. *Glengarry*, schooner; lost on Ninety Mile Beach, May 31, 1882. Inquiry held at Melbourne, June 30, 1882. Loss due to stress of weather and not to fault of master.

1499. *Pretty Jane*, s.s.; beached by the master on Ninety Mile Beach, May 31, 1882. Inquiry held at Melbourne, June 16, 1882. Master exonerated.

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1500. *Pretty Jane*, s.s.; stranded in Gippsland, Lake entrance, December 17, 1881. Inquiry held at Melbourne, January 6, 1882. No blame attributable to master.

1501. *Black Eagle*, s.s.; *Queenscliff*, s.s.; in collision in the River Yarra, April 25, 1882. Inquiry held at Melbourne, May 5, 1882. Accident caused by error of judgment on part of master of *Queenscliff*.

1502. *Helena*, schooner; stranded at Port Philip Heads, October 20, 1881. Inquiry held at Melbourne, November 4, 1881. Casualty due to cable parting. Master free from blame.

1503. *Olivia Davis*, barque; lost at Warrnambool, May 7, 1882. Inquiry held at Melbourne, May 23, 1882. Loss due to stress of weather.

1504. *Belle of the West*, s.s., and *Pilot*, s.s.; in collision in Hobson's Bay, October 10, 1881. Inquiry held at Melbourne, October 14, 1881. Both vessels to blame. Masters cautioned to be more careful in future.

1505. *Murray*, s.s.; grounded at the entrance of Gippsland Lakes, July 27, 1881. Inquiry held at Melbourne, August 19, 1881. No blame attached to master.

1506. *Dora Tully*, s.s.; stranded off Cape Takh, July 28, 1882. Naval Court held at Kertch, August 18, 1882. Rock on which vessel struck not marked on chart. Master much commended for his energy in saving ship and cargo.

1507. *Westport*, s.s.; stranded on rocks in Puaki Cove (subsequently foundering), June 14, 1882. Inquiry held at Wellington, N.Z., July 5, 1882. Master in default for neglecting the lead and taking ship to sea in an unseaworthy condition. Certificate suspended for six months.

1510. *Ferret*, s.s.; stranded near Kingston. Inquiry held at Port Adelaide, August 8, 1881. Vessel sustained no damage.

1511. *Young E. B.*, yacht; stranded at Yankalilla, July 12, 1882. Inquiry held at Port Adelaide, August 1, 1882. Casualty due to stress of weather.

1512. *Erwood*, brigantine; stranded on Annabella Bank, Port Natal, August 8, 1882. Inquiry held at Durban, August 14, 1882. Accident due to deficient towing power.

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1513. *Peruvian Congress*, ship; foundered in Bay of Bassein, July 18, 1882. Inquiry held at Rangoon, August 1, 1882. Loss occasioned by stress of weather, and the vessel being old and badly fastened.

1517. *Anniversary*, barque. Abandoned at sea, September 14, 1882. Inquiry held at Valetta, September 27, 1882. Abandonment justifiable.

1519. *Artemisia*, barque; lost at entrance of Yangtzse River, August 1, 1882. Naval Court held at Shanghai, August 8, 1882. Loss caused by unusually strong tide. Master free from blame.

1520. *Rhoda*, barque; capsized and sunk off Pensacola, September 9, 1882. Naval Court held at Pensacola, September 14, 1882. Casualty due to hurricane, and to vessel being in very light ballast trim.

BAHIA BLANCA AND PORT BELGRANO.

These two ports, situated on the east coast of South America, south of the River Plate, and belonging to the Republic of Uruguay, have recently come into note, owing to the development of trade, consequent upon the opening up of the adjacent districts.

Sailing directions for the vicinity will be found in South American Pilot, Part I., pp. 252-256, of the 1874 edition.

More recent information has been published by the German Government as follows:—

"*Port Belgrano—Directions and Buoys.*—A vessel bound for Bahia Blanca should always make the coast between Asuncion Point and Mount Hermoso, and keep it in sight until about eight miles from the latter. This eminence is readily recognised by a mast on the top, 167 feet above the level of the sea, which in clear weather is visible from a distance of 15 miles. There are no shoals in the neighbourhood of Mount Hermoso, and the roadstead is formed by the North bank and the shore, the general depth being about five fathoms. Although the holding ground is excellent, this roadstead cannot be recommended as an anchorage during the spring and summer months, as it is exposed to south-easterly, southerly, and south-westerly winds.

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"The first buoy is moored 12 miles S. 17° E. from Mount Hermoso, is painted *yellow*, and in clear weather is visible from a distance of five miles. It should be left to *starboard* in *entering*. The remaining buoys, which are to be also left to starboard, are *red nun* buoys, the average distance between them being about 7,000 yards. Between the eastern end of North bank and Point Nameless, a distance of eighteen miles, there are seven buoys.

"Another buoy bears S. 4° W. from Mount Hermoso, and vessels are warned against steering anything to the westward in passing this buoy, as they might thereby be led to enter a false channel.

"After passing this buoy the soundings will deepen to eight fathoms, and when in the Gateway they will again shoal so that when passing the last buoy the depth will be 6½ fathoms for about 1,100 yards. After that the water rapidly deepens to 13 fathoms, and then a vessel can follow the shore of Port Belgrano, keeping about one mile from it.

"In clear weather the masts of the sunken light-vessel *Manuelita*, lying off point Sacho de Guacho, are visible from a distance of about eight miles. Owing to the change of the channel this wreck is in a dangerous position for passing vessels, but serves as a leading mark when the buoys have gone adrift. The masts of the wreck and the beacon on Point Nameless enable those acquainted with these waters to find the channel.

"The next buoy lies off Arroyo Pareja (Pareja Creek), and the next off Punta Alta. Both must be left to *starboard* in *entering*. From the last buoy a staff on the north side of the entrance to Three Fathom Creek can be seen. The anchorage is opposite Sauce Chico, or Naposta. The Channel is navigable to this point for vessels drawing 16 feet. *Variation*, 12½° *E.*"

IMBITUBA BAY, BRAZIL.

Among our Nautical Notices for this month is an announcement of the establishment of a light for the benefit of vessels frequenting this locality. A considerable trade has sprung up in this vicinity during the last year, and the following sailing directions as com-

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municated by Mr. C. B. Templar to the *Shipping and Mercantile Gazette*, will probably be found serviceable to those engaged in trade with the port.

"Imbituba Bay is formed by a tongue of land terminating in a hill about 250 feet in height, and curving away to the N.E. It is well protected from southerly winds, but fully exposed to winds from the N.E. The soundings are regular, commencing at 10 fathoms, but shoal rather rapidly. The bottom is hard sand, and excellent holding ground. The prevailing wind is from the N.E., commencing with light airs, and gradually increasing in force, lasting from two to three days. Heavy banks of cloud then form to the S.W., accompanied by lightning and rain, and is a certain sign of wind from southward and westward. This generally happens about the beginning of the week, lasting from one to two days. The current follows the wind, southerly winds bringing up water, northerly winds taking it out of the bays and lagoons. The rise and fall of the tide is small, the greatest observed being 5 feet 2 inches at full and change of moon. During the winter months, from July to November, it blows hard from the N.E., gradually decreasing in force as summer approaches. Vessels drawing 16 feet water should not anchor in a less depth than 7 fathoms, with both anchors, so as to give ample room to veer away chain when necessary. It is advisable also to drop a kedge anchor astern to keep the vessel in proper position, as the current, generally after the N.E. wind has been blowing, sets round the bay, and brings the vessel across the sea. Should the vessel swing to the southerly wind, there is the risk of the anchors fouling, and masters should sight their anchors as soon as possible after. The summer gales are of short duration, and have not force or time enough to bring up a heavy sea, and with good anchors and chains there ought to be no difficulty in riding them out. Vessels that had taken the precautions mentioned rode out heavy gales. As a rule, it would not be advisable to send vessels to arrive in Imbituba during the winter months—that is, from the beginning of July to the end of November. At present (1882) there is no pilot stationed at Imbituba, but special application has

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been made for one. It is proposed to build a breakwater, and negotiations are now being carried on with the Brazilian Government to sanction a guaranteed loan for the purpose. Under any circumstances, masters of vessels should, after anchoring, take the precaution to go and sound between the vessel and the shore, and satisfy themselves that they have sufficient room in case it should be necessary to veer cable. It is owing to the neglect of this caution that three vessels were lost."

MARINE INVENTIONS.

Monthly List of Patents—Compiled for this Journal by Messrs. W. P. Thompson and Boult, British and International Patent and Trademark Agents and Consulting Engineers, 323, High Holborn, W.C.; also by Messrs. W. P. Thompson & Co., 6, Lord Street, Liverpool.

ENGLISH (APPLICATIONS).

4452. John Gunn, of Golspie, Sutherland. "Improvements in guard rails for fishing boats and other vessels."

4502. George Hughes, of Wolverhampton, Stafford. "Appliances to be used for the rigging of boats or ships' masts."

4518. Matthew Horsley, of Hartlepool, Durham. "Improvements in shipping and unshipping the rudders of ships and other vessels, partly applicable to other like purposes."

4519. Joseph Leather, of Liverpool; and John Knowles Leather, of same place. "Improvements in ventilating saloons, state rooms, and cabins of steam and other ships."

4526. Benjamin Constant Le Mossu, of MacLean's Buildings, New Street Square, Fleet Street, London. "A new or improved apparatus for preventing shocks to ships and other vessels when riding at anchor or moored to or lying alongside a landing-stage or wharf."

4533. James Scott, of Helensburgh, Dumbarton, N.B. "Improvements in the construction of ships and in the construction and housing of ships' anchors."

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4552. Arthur Bernard Rodyk, a communication to him from Nicolas Belfield Dennys, of Singapore, in the Strait Settlements. "Improvements in paints and compositions for coating ships' bottoms and submerged and other surfaces."

4804. Richard Smith, of Sherbrooke, Quebec, Canada. "Improvements in propellers."

4807. W. R. Lake, a communication from Joseph Henry Milligan, of Boston, Massachusetts, U.S.A. "Improvements in and relating to self-levelling sleeping berths for ships, parts of which improvements are applicable for other purposes."

4821. C. A. Abel, a communication from Charles George Vichoff, of 47, Rue des Mathurins, Paris. "A new or improved construction of vessel and apparatus for transporting afloat barges, vessels or objects of large dimensions."

BELGIAN.

58586. W. Fewster, of Ramsgate (England). "An improved vessel for saving life and property at sea."

51642. C. Corneby, of Poplar (England). "An improved revolving propeller for steam-vessels."

58725. De Maeyer, of Boom. "Steam navigation by means of a propeller."

FRENCH.

147634. Planus. "A propeller for navigation in general."

147669. The Industrial Company, of France. "A method of navigation."

147902. Damiano. "Armature for screw-propellers."

PATENTS PUBLISHED.

1073. John Elsie Mouland, of Roby, in the county of Lancaster. "Improvements in steamships or vessels propelled by self-contained power." March 6, 1882. 4d. This invention consists essentially in carrying up the skin of the vessel, so as to cover the same with a cylindrical oval, elliptical or other dome or cover. There are no outside works excepting a smoke-stack, wheel-house and wind-sail. The vessel is lighted from above by bulls-eyes or the like. The top may in some cases be flattened, and the hull be made

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with sloping sides, so as to present a triangular shape with rounded angles. The keel is not made straight, but from about one-third of the distance between bow and stern, the bottom line gradually rises towards the bow, this enables the vessel to "ride" better. The rudder is made double commonly, the two rudders operate jointly, but when one is put hard a port and the other hard a starboard, they serve as a seadrag. The roof is slightly curved, being highest amidships.

1106. Lake, a communication from Edgar Howard Farrar, of New Orleans, Louisiana, United States of America, Attorney-at-Law. "An improved method of, and apparatus or means for, preventing the shifting of grain, guano, coal, or other loose cargoes in ships." March 7, 1882. 6d. This invention relates to an improved method of, and means for, preventing the shifting of grain, &c., when carried in bulk. The ship is divided into compartments by transverse bulkheads. Along the ship's side, running fore-and-aft, a series of rows of stout metal hooks are placed. A strong flexible sheet is provided, strengthened if necessary with ropes or chains, and has eyes to hook on to the hooks above mentioned, the other edge being fastened to a beam. The arrangement of sheets, &c., may be adapted to the cargo and the vessel, but the chief feature of the invention is that the cargo is trimmed so as to present a curve at top, and that the above-mentioned sheets are, by blocks, &c., tightened down upon the same, thus preventing its motion. To allow for the cargo shaking down, the sheets are so made that they can be reefed like sails.

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THE

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THE RELATIONS BETWEEN SHIPOWNERS AND MASTERS.

THE shipping trade, like most other branches of commercial enterprise, has undergone some radical changes under the influence of the keen competition and the high-pressure mode of transacting business which characterize modern times. The sailing ship of the old style, owned by an old established firm consisting of one or two individuals, and leisurely making its way from one side of the world to the other as the winds happened to prove favourable, is rapidly disappearing, while its place is being filled by the fast-going steamship, owned by many different persons, who know little more of each other than they know of the South Sea Islanders, and hurrying from port to port as though the entire result of every voyage depended on the curtailment of its length to the smallest possible number of hours. There are many persons who profess to regret the change, but, since it must be regarded as inevitable, it would be mere folly to waste regrets over its appearance. Modern despatch and enterprise are accompanied by many disagreeable peculiarities, but these are not to be avoided by grumbling. Shipowners, like other employers of

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capital, must move with the times; the old and leisurely style of conducting shipping business is a thing of the past, and owners and shippers alike have to conform to altered conditions and necessities.

Among the various classes of persons connected with the shipping trade who stand affected by the changes above referred to, there are perhaps none who have experienced its unpleasant influences more keenly than the masters and officers of a certain class of steamships. A considerable amount of worry and anxiety has, doubtless, always been inseparable from their position, but this has been greatly increased as the steam carrying trade has been developed. We have received sundry communications on this subject, which, for various reasons, we do not think it advisable to print; but we will endeavour in this article to state the case on both sides fairly and temperately.

Masters now complain that in many cases they are hurried to sea before their vessels are fully prepared for the voyage, that the cargo is frequently tumbled in pell-mell, and dragged out in a similar style, and that the responsibility for the damage and loss which sometimes result from all this hurry is unjustly thrown upon their shoulders. In connection with this phase of the shipping trade our attention has recently been called to the book of "Suggestions for the Guidance of Captains and their Officers," issued by the Steamship Owners' Mutual Protection and Indemnity Association. These suggestions relate almost exclusively to the management of cargo, but with regard to this subject they touch upon a great variety of details. Masters are especially enjoined to carefully study, and "not merely read," their Charters and Bills of Lading, to see that no clause in the latter is inconsistent with the terms of the Charter-Party, and in all cases to insert qualifying words in the Bills, unless they are fully satisfied as to the weight, quantity, quality, and *condition* of the cargo. If the merchant objects to any qualification, the Bills are to be signed under protest, and if the protest be objected to, the master is to prepare Bills of Lading himself and hand them to the merchant. Masters of grain ships are warned to be on their guard against shipment of soft grain, and it is pointed out that any deficiency in this respect, especially

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in the case of grain stowed near the ship's boilers, will probably result in claims for damage. It is even suggested that damp grain from the bottoms of lighters is sometimes purposely stowed near the boiler bulkhead in order to provide a pretext for making claims of this kind. Apart from any clauses in the Bills of Lading, the master is, however, to take care that the cargo is sufficiently protected from the heat of the boilers. Under no circumstances must masters sign Bills of Lading until the officers' receipts have been produced in proof that the goods are actually on board, and on no account are they to sign ante-dated Bills, it being pointed out that complicated questions have arisen from irregularities of the latter kind; and it has been suggested to the Association that any master who commits a breach of this rule in future should be debarred from commanding any steamship entered on their list. Bills of Lading in a foreign language are to be translated, as in many cases they are drawn in terms which are inconsistent with the custom of the English shipping trade. And, as a preventive against claims for short cargo, it is urged that efficient tally-clerks should be appointed to assist in checking, especially in the case of certain Continental ports, where it appears that the tallies kept by the sworn weighers are often *made* to agree by means of a little subsequent manipulation over a friendly glass of wine.

These and many other particulars, too numerous here to mention, are touched upon in the book of "Suggestions," and there can be no question that, in the main, the work is one of considerable practical utility. Yet shipmasters complain that, in some cases, the "Suggestions," together with the very serious threat by which they are accompanied, will place them between the horns of a dilemma. In the introductory note there is a warning to the effect that the Directors of the Association have been compelled to insist on the dismissal of captains and officers who have refused to profit by the experience which the Association has gained; and of course the inference is that disobedience in future will entail a similar penalty. The difficulty involved in the task of serving two masters has long been proverbial, and this is precisely the business which ships' officers now maintain that they are expected

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to undertake. The Association threatens them with ruin on the one hand, yet their owners on the other decline to give them permission to adopt the Association rules as an absolute guide. They are still expected to use their own judgment in all cases, and thus they are left in what is by no means an enviable position.

As an illustration of the danger which sometimes besets a captain who refuses to sign clean Bills of Lading for a cargo in doubtful condition for example, a case was recently brought under our notice, in which a refusal of this kind resulted in the following telegram from the shipper:—"If master of s.s.—— remains in your employ we withdraw our shipments in your vessels." Moreover, as regards the necessity for studying Charters and Bills of Lading, masters assert that in many cases they have no opportunity of doing so, as these documents are sent by mail, the ship being despatched as soon as the cargo is on board. It often happens too that Charters contain a clause to the effect that the captain is to employ Charterer's stevedore and tally-clerks, the ship paying the latter, but no responsibility to rest with the Charterer, and in cases of this kind it is asked how masters can be fairly made responsible for shipping damaged or badly packed cargo, or for short delivery?

It is also alleged that many of our modern cargo steamers are built for the purpose of being sold to unsuspecting shareholders rather than for carrying cargo safely and well. Weeping butts and improperly constructed boiler bulkheads are not unfrequently the true causes of damaged cargo, and to throw the blame upon bad stowage or on the defective condition of the cargo when shipped, is manifestly unfair. We have heard it suggested that shippers are aware of the defective bulkhead arrangements in vessels of this class and that this is the true reason why proximity to the boilers has come to be regarded by them as an advantage in the case of grain in a damp condition.

Shipmasters contend that the number of "wheels within wheels" connected with our modern shipping trade are being greatly increased, and that the widely spreading ramifications of the commission system are the actual roots of many evils which at present exist. A large proportion of our cargo steamers are now owned

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by anybody and everybody, their control being vested in managing owners who are paid by a percentage on the gross earnings. And certainly, if we may judge from a prospectus recently issued by a firm of this kind, a copy of which is at this moment lying before us, this complaint with regard to discounts and commissions is not altogether groundless. For obvious reasons we do not mention the name of the firm in question, but we may say that the prospectus has been issued for the purpose of inviting subscriptions for shares in a new cargo steamer they are about to have built, and, among other inducements held out to investors, there is a paragraph to the effect that "the price quoted is the nett contract price of the builders, no return whatever being received by the managers." We have no doubt that intending subscribers who may have felt any doubts with regard to the honesty of the projectors of this particular venture will be fully satisfied by this assurance that their pockets are not about to be picked, but at the same time it is sad to think that such protestations of honesty are required. Perhaps the protest in this case may have been considered necessary from the fact that the firm of managing owners and that of the builders are of the same name, but the publication of such an ingenuous assertion in a printed circular is a sufficient index of what sometimes takes place in the shipping world. We have no reason for calling in question the honesty or good faith of either of the firms mentioned in the prospectus; yet at the same time it is impossible to avoid the conclusion that in many cases a certain amount of the capital subscribed by miscellaneous shareholders in steamships must find its way into channels for which it was never intended.

It is evident that the system of minutely divided ownership which now prevails so largely, by no means tends to render the position of masters more pleasant. We believe the majority of managing owners are remunerated by a percentage on the earnings of the steamers under their control, and this being the case, it is not surprising that they endeavour to cut expenses down to the lowest possible point and to hurry the vessels from port to port without a moment's unnecessary delay. No doubt all this occasionally produces unsatisfactory results, and then it is that

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the shareholders have to be pacified, and the unfortunate master comes in for a share of the blame. But of the extent to which the more serious statements with respect to the existence of a wholesale system of commission are true, we must hesitate to pronounce a decided opinion. The frank disclaimer contained in the prospectus to which we have just referred shows that managing owners are acquainted with more than one method of paying themselves in this country, at all events, and the inference is that their knowledge in this respect is not limited to their dealings with shipbuilding firms. For the credit of the shipping trade it is to be regretted that such practices should exist, and in the interests of masters and officers it is also to be deplored that the modern system of shipowning should be adding to the heavy responsibilities and the unceasing anxieties by which their position is necessarily beset.

It is perhaps needless to remark that the interests of owners and masters should be reciprocal. Apart from the abstract justice of the case, it is, on the one hand, not unlikely that owners might bring upon themselves serious evils, by being selfishly and inconsiderately exacting in respect of the services to be rendered by masters in their employ; and, on the other hand, masters who failed to exercise at all times a conscientious regard for their owners' interests would not be justified in complaining of being censured or even displaced. But the direct relations of owners and masters are widened in the case of such managing owners as our correspondents complain of, and here it seems to us that masters should endeavour to hold their own. Where the conditions of service required are known to be hard or unjust, masters should hesitate or absolutely avoid engaging themselves, in which case managing owners would probably have to abate their requirements, or content themselves with the services of a lower class of masters, who might be prepared literally to obey orders, but who would not be qualified to deal with the numerous and complicated questions of law and custom which continually arise in connection with our foreign shipping trade; who would not be qualified to take upon themselves any direct personal responsibility involving intelligent judgment and nice discrimination, and further, who

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would probably be inclined to study their own interests rather than those of the managing owners whenever opportunity offered.

It cannot, however, be denied, that although speaking generally, the position of masters in the British Mercantile Marine has of late years grown more onerous and less remunerative than formerly, yet, nevertheless, competition for appointments to the command of vessels is as keen as, if not keener than ever. There are still plenty of services in which captains may find profitable employment under reasonable and considerate owners; but so long as the market is full of candidates, the rapacious managing owner will have little difficulty in finding masters willing to serve under almost any conditions, and men so pushed by urgent necessity generally have to bear as well as they can the hardships of their lot. But it seems to us that some independence of action on the part of masters would not only uphold the honour and dignity of their profession, but also render impossible such treatment as they now complain of at the hands of managing owners.

RECENT FREEBOARD TABLES.

IN our August number we gave the approximate Tables of Freeboard which have been for some time in use by the Board of Trade staff and by which they have been guided in the performance of their important duties in detaining overladen ships. In the September number we placed before our readers a rule which has been used for some years by Mr. Jas. Wimshurst, the principal Shipwright Surveyor to the Board of Trade for iron ships, and which, as we stated at the time, has the very great merit of simplicity, while giving results not differing much from those obtained by some much more elaborate rules. In striking contrast with these rules are the Tables of Freeboard recently issued by the Committee of Lloyd's Registry, which are of such an elaborate character that they would appear to make provision for every type of ship and for every peculiarity of construction. Coming from so high an authority they, of course, have much to recommend them,

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and we believe they will be largely used by shipowners. A significant statement has recently been made to the effect that a vessel which was some time since detained by the Board of Trade Surveyors has recently had her freeboard marked by Lloyd's new rule, with the result that her marked freeboard now is the same as the freeboard she had when she was detained by the Board of Trade as overladen. We do not hastily conclude from this that Lloyd's rule will give uniformly, or indeed in the majority of cases, a smaller freeboard than the Board of Trade rule, but we do think that some shipowners will set about ascertaining which rule gives them the least freeboard for any given ship, and will straightway adopt it, knowing that no Court of Survey will condemn what is stamped with the approval of either Lloyd's or the Board of Trade.

We propose in the present paper to compare the rules both as regards the methods adopted and the results obtained.

The Board of Trade rule proceeds upon the old system of rate of depth of hold, but the rate is determined in steamers with reference to the length, in sailing vessels with reference to the gross tonnage.

Mr. Wimshurst's rule makes the rate vary directly as the length, but by the Board of Trade rule the rate varies in a somewhat smaller proportion than the length. By reference to the two rules it will be seen that Mr. Wimshurst's is for winter voyages only, and that the point of contact between the two rules is for this class of voyages in the case of vessels of 220 feet length. Below this Mr. Wimshurst requires lower rates, above it higher ones. For every increase of twenty-five feet in the length the Board of Trade rule requires an increase of ·2 in the rate of freeboard, while Mr. Wimshurst's rule requires ·25.

Lloyd's new Tables of Freeboard proceed upon the system of so-called co-efficients of fineness: they are in fact a revision of Mr. Martell's tables of 1873. They are now however put forward officially by the Committee of Lloyd's Registry. We quote the preface to them with a view to showing how they are to be applied in practice.

"These tables are to form a basis for the guidance of the Committee in assigning load-lines to vessels when requested by their owners to do so

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Each vessel will be dealt with on her own merits. In the case of vessels which are not new, special consideration will be given to that which has hitherto been the practice in loading them and to the manner in which they have done their work.

"If at any subsequent period it can be shown that the data and figures which have been adopted in formulating these tables require revision, the Committee have the power to amend the tables and rules accordingly.

"After a load-line has been determined, it may be altered by the Committee on reasonable and proper grounds being shown for such alteration.

"The surplus buoyancy applicable to cargo carrying vessels as indicated in the following tables will, it is considered, afford sufficient lifting power to give an adequate amount of safety, while the corresponding freeboard secures a height of deck above water, sufficient for the purposes of navigation.

"It is desirable, however, to call attention to the fact that the safety of vessels at sea depends, not only on surplus buoyancy and freeboard, but also among other considerations upon a proper amount of stability, which is governed by the distribution and stowage of the cargo, according to its nature and weight.

"In the application of the tables it will be required, that when the freeboard of a vessel is desired by the owner to be inserted in the Register Book, he should first submit what in his opinion is suitable; and no freeboard will be assigned by the Committee, until the vessel has been surveyed by a Surveyor to the Society, and all the particulars reported on for the Committee's consideration."

The figures given in the tables are for first-class vessels; other than the highest class "will have an increased freeboard assigned in proportion to their relative strength."

Similarly the Board of Trade rules are framed for vessels of the highest class, except in the case of large sailing ships, where a decrease in the freeboard given by the rule is admitted for vessels of the highest class, but in the case of these vessels an exception is made where trying cargoes are carried.

It will be observed that the Board of Trade rule gives three rates for steamers:—A. for summer, B. for winter, and C. for North Atlantic winter. Similarly Lloyd's rule provides that flush-decked vessels must have their freeboard increased from that given in the tables to the extent of 10 per cent. for North Atlantic winter voyages. The corresponding increase by the Board of Trade rule

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from A. to C. is in large ships 10 per cent., but in small ships it is over 20 per cent.

In our remarks upon the tables and in our comparison of them with the Board of Trade rule, it will perhaps be most convenient to consider the case of vessels without deck erections first.

The main principle upon which the new tables are based is the same applied in framing Mr. Martell's tables of 1873, that is, a percentage of the total volume of the ship is to be above the load water-line as "spare buoyancy," that percentage is to vary with the size of the vessel from 22 as its lower limit in the case of flush-decked steamers of 10 feet depth and of medium proportions, to 30·5 in vessels of 31 ft. depth. This percentage is to be ascertained by means of the "co-efficient of fineness" obtained by dividing the gross registered tonnage below the upper deck of the vessel, expressed in cubic feet, by the product of the length, breadth and depth. The co-efficient of fineness of a ship is usually understood by naval architects to mean the relation of her volume to that of a parallelopipedon of the same three principal dimensions. The under deck register tonnage of a ship is her internal volume expressed in tons of 100 cubic feet each, and her co-efficient of fineness as regards tonnage is obviously the ratio borne by that volume to the product of her inside length, breadth, and depth, that is to say, her length, breadth, and depth for tonnage, three dimensions which do not appear at all on the register. On the other hand the co-efficient of fineness of her external volume would be the relation of that volume to the product of the length, breadth, and depth of such volume, but of these three dimensions one only appears on the register. In Mr. Martell's tables of 1873, he took the three registered dimensions, and we showed at the time that two ships of precisely the same shape, except that one had an upright and the other a projecting stem, would by his rule have a very considerable difference in freeboard due to that cause alone. We are glad to see that in the new tables this has been obviated by substituting for the registered length, the length from the inside of stem to the fore side of the rudder post, on, or in a line with, the deck. As one dimension has to be taken from the drawing, or from the ship, why could not the

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other two have been so taken, and then the co-efficient would have been, what it is not now, a real co-efficient of fineness, not affected as the present co-efficients are by the presence or absence of ceiling, larger or smaller scantlings, greater or less round of beam, &c. The registered breadth is, as we have said, the extreme breadth outside; the registered depth is an inside depth, but it is the full depth of hold amidships, while the depth used in calculating tonnage is the full depth, less one-third of the round of beam. However, even with a genuine co-efficient of fineness, instead of a co-efficient of fineness and thickness combined, it does not follow that a given percentage of volume will be cut off with accuracy. There may be two vessels of exactly the same dimensions, of the same co-efficient of fineness, and yet one will be fine because she has large rise of floor, the other, because she has fine ends: it is thus obvious that the same lineal freeboard in the two will not cut off equal volumes, and that the ship whose fineness is due to rise of floor will be at a considerable disadvantage. Moreover, as we shall see further on, the freeboard has to be modified for sheer and for round of beam, and hence we come to the conclusion that if freeboard of volume were the thing to be aimed at, it would be much better to have the true and accurate percentage of spare buoyancy, only to be obtained from the scale of displacement of the ship, the ordinary scale being of course extended so as to include the whole volume of the ship.

A new feature in Lloyd's tables as compared with Mr. Martell's tables of 1873 is the moulded depth. The percentage of spare buoyancy increases as the moulded depth increases, and the additional percentages of freeboard for extreme proportions are based upon ratio of moulded depth to length. The *moulded depth* of an iron vessel "is the perpendicular depth taken from the top of the upper deck beams at side, at the middle of the length of the vessel to the top of the keel." It thus differs from the depth of hold by the inclusion of the ceiling (if any in flat of bottom) and the floor plates and by the exclusion of the round of beam. The reason for its introduction would appear to be to fit the tables for use in connection with vessels having longitudinal framing and double bottoms, a class which has become very common of late.

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The tonnage depths are taken to the top of the double bottom and hence the depth of hold bears a varying relation to the total depth of the vessel. In their case too, the "co-efficient of fineness" fails to be of any use, and we suppose that Lloyd's Committee will, in fixing the freeboard of these vessels, resort to the scale of displacement.

A somewhat singular arrangement is made to meet the case of iron decks. The "moulded depth" does not include the deck in any case, nevertheless in cases where there is only an iron deck, the usual thickness of a wooden deck is deducted from the moulded depth, the freeboard is calculated from this reduced depth, and is set off from the iron deck. A simpler arrangement, one would think, would have been to measure moulded depth to the top of the deck whatever the deck might be. It is true that the strength of the ship depends upon the position of the iron deck, while height of platform and stability depend upon the position of the upper surface, whatever that surface may be.

Not one of the least important features of the question is the comparative result given by the two official rules. It is not very easy to put them side by side except in cases of particular ships, and that of course would be of small general interest; but we will endeavour to make some kind of comparison, and it will, we think, be most instructive to do this for flush-decked iron steamers. The tables are framed with a view to vessels whose length is not over twelve times the moulded depth. We will take steamers of moulded depths

10 — 15 — 20 — 25 — 30

and corresponding lengths—

120 180 240 300 360

The registered depth of hold would usually be in a place where there is no ceiling, and would in the vessels we have taken be for each something like

9·5 14·3 19· 23·9 28·5

The freeboard taken from the tables gives respectively for vessels of medium fineness represented by the co-efficient ·74, in inches:—

16½ 28½ 43½ 61 80

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which expressed in rates of inches per foot depth of hold are respectively

1·74 2· 2·3 2·55 2·8

In the Board of Trade rule the corresponding rates of inches per foot depth of hold would be

1·8 1·8 2·15 2·6 3·1

From this it will be seen that in the smallest class of vessels Lloyd's rule gives a smaller result, for those of medium size larger results, while for vessels of 300 feet and over, the Board of Trade rule requires considerably more freeboard than Lloyd's.

Extending the comparison to the case of extreme proportions, we find that starting with vessels of over 12 depths in length Lloyd's require additional freeboard varying by percentages up to 10 per cent. in the case of vessels of 15 depths in the length. For this extreme type the lengths corresponding to the depths originally taken will be

150 225 300 375 450

the freeboard required by Lloyd's expressed in rate of inches per foot depth of hold will be—

1·9 2·2 2·5 2·8 3·1

The corresponding rates by the Board of Trade rule are—

1·8 2· 2·6 3·2 3·8

It appears probable from this that Lloyd's rule will find favour, at all events with owners of flush-decked steamers over 300 ft. long. We shall show, further on, that this feature of the comparison appears with increased force when deck erections are taken into account.

In this comparison we have taken the Board of Trade rates for summer voyages. Lloyd's tables require an increase of 10 per cent. in freeboard for Atlantic winter voyages, but the Board of Trade rule in no case requires a smaller increase than 10 per cent., while in the small vessels where its summer freeboard is less than that of Lloyd's, it requires as much as 20 per cent. increase for winter Atlantic voyages.

It is not easy to make an exact comparison between the freeboard required by Mr. Martell's tables of 1873 and by the present tables. The alteration in the length used for obtaining the

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co-efficient prevents exact comparison, but if we take the case of flush-decked steamers with upright stems, which latter is by far the more common condition in the case of cargo steamers, the new length will merely differ from the old by the size (moulding) of the stem and sternpost. Supposing the corresponding co-efficient to be reduced from ·74 to ·73 we find the freeboard for vessels of medium proportions of depths the same as before to be respectively in inches

20¼ 33¼ 50¼ 73 104

instead of by the new tables

16½ 28¼ 43¼ 61 80

To show the comparison better, we give the rate of inches to the foot depth of hold as follows:—

Lengths in feet	120	180	240	300	360
1. Lloyd's Tables	1·74	2·	2·3	2·55	2·8
2. Mr. Martell, 1873	2·1	2·3	2·6	3·06	3·65
3. Board of Trade Rule	1·8	1·8	2·15	2·6	3·1
4. Mr. Wimshurst's Rule	1·2	1·8	2·4	3·	3·5

Extending the comparison as before to vessels of extreme proportions we find the rates as follows:—

Lengths in feet	150	225	300	375	450
1. Lloyd's Tables	1·9	2·2	2·5	2·8	3·1
2. Mr. Martell, 1873	2·3	2·5	2·85	3·35	4·8
3. Board of Trade Rule	1·8	2·	2·6	3·2	3·8
4. Mr. Wimshurst's Rule	1·5	2·25	3·	3·5	3·5

It will be seen that in large vessels the maximum and minimum rates correspond respectively with the views of Lloyd's in 1873 and in 1882.

It may be as well here to state the differences in actual measured freeboard as given in the tables due to fineness or fullness of volume. We selected for the purpose of comparison a medium co-efficient ·74, the co-efficients given in the tables vary from ·64 to ·82, and the difference each side of the medium is only ·1 to ·16 inches per foot depth of hold. In other words the freeboard required for a very full vessel (·82) is 5 to 6 per cent. more, and for a fine vessel (·64) 5 to 6 per cent. less than for one of medium form.

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So small a difference might easily have in each case been assigned by a glance at the form of the vessel with a sufficiently accurate result, and so have saved the elaborate tables which after all do *not* give accurate results.

The questions of sheer and round of beam are very carefully dealt with by Lloyd's new tables. The tables are framed for a mean sheer of 15 inches per 100 feet of the length, measured at the middle line, and for a mean round of beam of one quarter of an inch for every foot in length of the midship beam. Sheer and round, above or below these amounts necessitate appropriate additions or deductions. The Board of Trade rule which is avowedly intended to furnish points of departure, merely leaves the exact allowance or deduction as the case may be to be determined by the surveyor. It is plain from its terms that proper importance is attached to the effect of round of beam and sheer. We should not mention this but for the fact that some vessels have been recently built with very little round of beam, in order to show a large freeboard in proportion to their depth of hold. We do not think any such attempts to evade the incidence of the rule will meet with more success than they deserve.

As to the point from which freeboard is measured, Lloyd's tables say simply the top of the deck at side at the middle of the length of the vessel. The Board of Trade rule directs that it should be measured to the top of the deck next the waterway amidships, except in the case of deck erections exceeding half the length of the ship, when it is to be the lowest point of the exposed deck. In the case of an iron ship with the ordinary wide gutter waterway and fair round of beam, the edge of the deck next the waterway may be more than an inch higher than the edge of the deck would be if the deck were continued at the same curve out to the side. This gives wooden decks an unfair advantage over iron ones, there being in the latter case no waterway. In a rule only meant to furnish points of departure this refinement need have no place, but it should be noticed in connection with the more elaborate tables.

We believe however that freeboard should always be measured amidships whatever and wherever the deck erections may be. To provide for a measurement of it elsewhere than amidships holds out

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inducements to owners to trim ships by the stern, and complicates the action of allowances which may be made for deck erections.

Lloyd's new rules provide for the case of spar and awning-deck vessels by a separate set of tables in each case.

In spar-deck vessels the co-efficient of fineness is found by taking the registered tonnage and the depth to the spar-deck, and the freeboard obtained from the tables is measured from the spar-deck. The height of spar-deck assumed for the purposes of the rule is 7 ft., and for greater or less heights modifications are made accordingly. Mr. Martell's tables of 1873 directed that the freeboard should be measured from the main-deck and should be one-half the freeboard of a flush-decked vessel of the same dimensions up to the main-deck. The Board of Trade rule agrees on this point with Mr. Martell's rule of 1873. On looking at the tables it will be seen that the reduction of freeboard of some spar-deck vessels from that given by the old rule is enormous. Thus a vessel of 16 feet moulded depth to main-deck and medium co-efficient would by the 1873 tables have a freeboard to main-deck of over 18 inches, by the new rule the main-deck will be 12 inches under water. Spar-deck vessels will not by the new rule be required to have increased freeboard for extreme proportions.

In Mr. Martell's tables of 1873, awning-deck vessels were to have seven-tenths of the freeboard which a flush-decked vessel of the same dimensions below upper deck as the awning-deck vessel below main-deck would have. The Board of Trade rule fixes the fraction at two-thirds. In the new rules there are separate tables for awning-decked ships. The co-efficient of fineness is found for the volume below the main-deck and the freeboard is measured from the main-deck. Comparing awning-deck vessels with flush-deck vessels of the same depth of hold (of course to the main-deck only in the former), we find the fraction to vary from ·55 in small vessels to ·78 in large ones, but awning-deck vessels are not required to have additional freeboard for extreme proportions.

Coming now to the case of vessels with deck erections, which, at the present time form so large a proportion of cargo-carrying steamers, Lloyd's new rule deals with them as regards freeboard by means of a method which to our thinking is very satisfactory.

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First it is supposed that the vessel had no deck erections whatever, and her freeboard is ascertained on that supposition. Next the freeboard is found on the assumption that the vessel had an awning-deck, and the difference between the two is obtained. Then the length of deck covered by superstructures is ascertained and its proportion to the whole length found, and a fraction of the reduced freeboard which would have been given for an awning-deck is given for the superstructures. That fraction is somewhat less than the proportion of the deck covered and is regulated by the nature and position of the superstructures.

On the other hand, the Board of Trade rule is at its weakest in the question of deck erections. A reduction of freeboard to the amount of one-third is allowed if an awning-deck be added to a ship, and in a ship of the largest class this one-third may be as much as three feet. If, however, in place of the awning-deck the vessel have a poop extending half her length, the reduction in respect of it is only four inches. The difference in value of a poop and an awning-deck is considerable, but is not so much as the difference between four inches and three feet. The fault of the rule is, that it gives the same allowance for deck erections without regard to the size of the ship. While, however, we believe that the Board of Trade rule underrates the value of deck erections, we think it will be found in practice that Lloyd's tables as much overrate it. Our approval is distinctly of the method used in the tables on this point, not for the figures in the fractional rates. In Mr. Wimshurst's rule the deck erections affect freeboard in the proportion which their tonnage bears to the gross tonnage of the ship.

In the case of sailing ships it is not easy to institute a comparison between the results by the Board of Trade and Lloyd's rules, for the reason that while the tables of the latter, though differing considerably from the tables for steamers, are yet based on the same principle, yet in the former the rule is framed upon an entirely different principle to the rule for steamers. The rate of inches per foot depth of hold varies, as we have said, for steamers with the length, for sailing vessels with the gross tonnage. It would appear that this method of variation was

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adopted on consideration that sailing ships do not show such differences in proportions as do steamers. From the few figures we have been able to go into on the subject, we believe it will be found that in the large iron sailing vessels of the type which have been built in such large numbers during the last year or two, the freeboard by Board of Trade rule will be found to be ten to twenty per cent. over that given by Lloyd's new tables. Even with the deductions which have been noticed in commenting upon the Board of Trade rule in our August number, its results are still somewhat in excess of those of Lloyd's rules.

We are certainly of opinion that in this case the larger rate is the proper one. The modern sailing ship has very large beam compared with depth. If her cargo be stowed in such a way as to give her moderate metacentric height so that she will be easy at sea, her reserve stability must be small unless she has large freeboard. If, on the other hand, she has large metacentric height and small freeboard, she is so uneasy at sea that she takes in large masses of water. This state of things has been exemplified more than once by the putting back of large new sailing ships from stress of weather, in consequence of the decks being so constantly flooded that large quantities of water got below through ventilators and other small openings in the deck.

We should have been glad if Lloyd's Committee had attempted to formulate the principles upon which the tables have been compiled. Much care has, we believe, been bestowed upon them, and scarcely a single detail has been left out of the account. To some extent they no doubt represent actual practice in the loading of ships, they certainly give results much nearer actual practice than the tables of 1873. We have no doubt also that strength as compared to load has entered into the consideration, but no one except the Committee knows at present how far actual practice has been the guide, and how far other considerations have come in. Practical experience may, in some classes of ships where such experience is considerable in amount, be of much value, but in the present day new types are constantly presenting themselves, and the experience of the past requires very careful application if it is to be of any value.

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Generally speaking the actual purpose and use of freeboard may be stated as follows :—

1. To ensure the height of platform essential for working the ship, and for proper security of the necessary deck openings.

2. As a limitation of the dead weight carried by the ship, and of the consequent strain to which she is subjected among waves.

3. To ensure a reserve of stability at any angle to which the vessel is ordinarily liable to be inclined.

These three requirements would press with varying force upon different classes of ships, and a complete system of rules of freeboard must at least secure for every ship that all three should be met.

We believe that the new Lloyd's tables attempt to comply with the first two requirements, but fail to do so accurately and efficiently, and for that reason and also because they all but ignore the third condition, we believe they cannot even form a basis for a complete and satisfactory settlement of the whole question.

We are also very much afraid that in actual practice they will have the effect of bringing about a general decrease in the freeboard of large ships.

In comparing the Board of Trade rules of freeboard with Lloyd's tables, it must always be remembered that the former are intended to be used merely as points of departure, and that very much is and must be left to the practical knowledge of the surveyor. The Committee of Lloyd's Register also say that they intend to deal with every vessel on her own merits, but so many details are taken into account in the tables, that after all, exceedingly little remains to be settled in applying them to a special case. Additional freeboard to that given in the tables may be required for vessels of low class, and also for vessels which from their proportions would probably be crank when grain-laden, but we can see no other respects in which any material modification could consistently be made. On the other hand, the Board of Trade gives a more general rule, and leaves greater latitude in its application.

As regards the practical effect of the two rules, we have shown that Lloyd's tables require more freeboard from small flush-decked vessels than the Board of Trade rule, but much less from large vessels, especially those of extreme proportions. The very liberal

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allowance given for deck erections in Lloyd's tables will permit well-decked vessels to load much deeper than they would under the Board of Trade rule, and thus it comes to pass that the very class of vessels which in inquiry after inquiry by the Wreck Commissioner have been found overladen, will be able to continue to load deep under the protection of Lloyd's.

MERCANTILE MARINE EXAMINATIONS.

WHEN we undertook the invidious task of discussing the defective educational status of the officers of the merchant service as largely due to an inefficient system of examination, we fully anticipated that our views on this important subject would meet with more or less of censure. It must always happen that not a few among a numerous body of men engaged in any particular service will feel aggrieved when any innovation on the ordinary routine is proposed. But we are not alone, nor were we the first in the field, in pointing out the defects of our seamen and navigators as regards education,—more especially in those branches which of necessity, and from the nature of the vocation, must be of the greatest practical value to them. Mr W. S. Lindsay, a man of intelligence and tact, whose early life had been spent at sea, and who subsequently became a shipowner and member of Parliament, was fully conscious of our negligence as a nation on this score; and it was long after the present system of examinations of merchant officers was instituted that, in the *History of Merchant Shipping*, he told us that "we ought to direct our attention more earnestly than we have yet done to the education of our seamen. If education is necessary on shore, it is still more so with seamen, and yet we have done practically nothing as a nation to assist them in gaining knowledge, and especially that description of knowledge required in their calling. We have not seriously attempted any practical scheme for their education."

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It may possibly be going too far to say that "an ardent desire to lay scientific foundations for practical pursuits has seized upon all classes of the community;" but it cannot be doubted that the continued call for an increase in the number of educational institutions and the successful establishment of technical schools and colleges are sufficiently indicative of progress in a new direction—showing an earnest desire on the part of students to study the principles which rule the acts they perform in their daily industries, and bespeaking a reluctance to go on working in the lines of the old routine without knowing the why and the wherefore. The various professions are equally active on the same basis; students therefore who aspire to join the ranks of any of them must, after undergoing a higher and a more systematic training than formerly, be capable of passing a more searching examination in everything connected with their intended vocation, theoretical as well as practical. Learning by the unsatisfactory process of "picking up" is out of date.

Is the merchant service alone to be unaffected by the intellectual wave that is passing over the country? Will the public be content that it should be so? Will the men themselves continue to be satisfied?—We do not believe it. No progress towards a better state of things will, however, be possible so long as it can be said, as already pointed out in our February number, that the instruction given to masters and mates is almost, if not entirely, confined to the "cram" required to pass the examination of the Board of Trade for a certificate under the Merchant Shipping Act,—so long as the standard of requirements fixed for these examinations is merely an empirical or rule of thumb knowledge of certain practical rules in Navigation and Nautical Astronomy,—and so long as a candidate is considered to be sufficiently well up in a given subject when he can answer correctly in writing a set of well-known *printed* questions, which are to be found as *appendices* to the Board of Trade Regulations, Exn. I.

On a recent occasion Sir Thomas Brassey, M.P., when addressing the Chamber of Shipping, is reported to have said that as regards the officering of the Mercantile Marine, he thought that in order to secure uniformity of attainments, there ought to be a well-considered

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standard of examination. True: but surely the selection of nineteen or twenty problems in Practical Navigation and Nautical Astronomy, together with 137 *stereotyped* questions relating to Definitions, Sextant, Chart, Deviation of the Compass and Cyclones, answers to which can be learnt by rote and then written out, cannot be considered an efficient standard. As a fact the examination as it stands is perfectly unique,—incomparable with that of any other class or profession in this country or abroad,—remarkable only for its useless prolixity on the one hand, and its looseness on the other, since it rather tests a candidate's memory than his knowledge. Nor can there be any improvement, except through a total alteration of the system, and a thorough revision of all that bears on the examination as found in Exn. I., under the various headings of "qualifications," "instructions to examiners and candidates," "special notice to candidates," and "appendices." The change must be in the direction of combining theory and practice; compelling the men to study the whole subject, not selected portions of it; and the substitution of marks for the "one minute of position" test. If it was necessary in 1851 to make the standard of qualifications "as low as possible" to meet the exigencies of all cases, and of all ranks of the profession, surely the time of probation must long since have passed; if it has not, then thirty years of examinations have been thrown away.

In all we have previously said, and now say, our strictures in no way apply to the examination in seamanship, which is essentially technical in its character, appertaining to a knowledge which could only be acquired by service at sea. It may therefore be taken as conclusive that gentlemen who have passed many years of their lives in such service, who have worked their way through all grades of the profession and been several years in command, and whose testimonials from owners they have served are of a high character, are properly selected as examiners in seamanship; for in this part of the examination none other than such could test with equal ability the qualifications of candidates for the different grades of certificates of competency.

But we take leave to doubt whether such service is *per se*

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conducive to the making of an efficient examiner in navigation, nautical astronomy, magnetism, &c. The Board of Trade came to that conclusion in 1871, and thenceforward on the appointment of an examiner, his "fitness" for the office "was to be tested;" one of his qualifications—and a very essential one—was to be "a knowledge of spherical trigonometry, and its application to all problems in nautical astronomy;" but this part of the test has never been in force—remaining to this day a dead letter.

Among the examiners the cry for thirty years has been, even when the examination in navigation was the work of six or eight, instead of as now the work of fourteen, hours, that they could not get from the candidates what they wanted, with the standard as it existed at the time. The sufficient answer to this is that there has always been a superabundance of officers; and to the extent now of at least four or five times as many certificated men as there are ships in which berths can be obtained. When nothing better is to be got, and when the pinch comes, they go as boatswains or A.B.'s, or work their way to the colonies at a shilling a month,—and yet the number of candidates for examination is increasing year by year. The fact is that there has never been a time when the Board of Trade could with greater propriety, and without any strain on the service, issue a notice that on and after a given date (unfortunately it could not well be less than a two years' notice from January next), every candidate for any grade of certificate must undergo an examination in the theory and practice of navigation and nautical astronomy, and subjects allied to them useful in conducting a ship in safety from one port to another. The time is singularly appropriate for the introduction of a new and better system of examination; now, when technical colleges are springing up in every part of the country, and when every university, school, and profession has been called upon to remodel and revise its educational codes and its methods of examinations to such an extent that they shall be more consistent with the advancing intelligence and requirements of the age.

It is futile to say that our seamen could not be trained towards a higher standard. Is the rank from which our officers come less intelligent than that which furnishes masters and mates for

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the ships of other maritime nations? We think not; and yet these get what they want in an examination which embraces both the theory and practice of the subject. The stereotyped form of question is chiefly the bane of our system; the candidate whose written answer is received as sufficient, may be considered to be fully up to the standard of the well-known printed question, but it does not therefore follow that he is up in the subject. Methodical instruction and training have no place here; given the capacity to write, and a memory capable of retaining for a limited period a few short descriptive (but too generally to the writer, meaningless) sentences, then, if the problems in navigation have been correctly worked, that is with *arithmetical* accuracy, the candidate is far advanced in the direction of getting a certificate of competency. The examination for the "ticket," as it is half jocularly, half contemptuously called, which should have been a stimulus to the acquisition of knowledge, and have compelled the candidate to study, has been of no assistance to him from an educational standpoint.

Rumour says that the introduction of theory into the examination would have the tendency of destroying more than half the navigation schools in the United Kingdom. So much the better, if they are mere "cramming shops," and nothing better. We know that in large numbers of them the teacher is only one stage in advance of those he undertakes to instruct, and that advantage he retains only because he is *perpetually* "grinding" in the one direction, and on the basis of one well-known system, which can be gathered from the Board of Trade Exn: I. "Regulations relating to the Examinations of Masters and Mates in the Mercantile Marine."

Another rumour is also not unfrequently whispered about—that the examination of masters and mates has been so formulated that there shall always be a sufficiently large number of officers ready for employment, and from which shipowners can make their selection. Though we give but little heed to this, we should think it unwise not to mention it.

It is no infrequent thing for nautical men, who advocate the *laissez faire* system, to point to the great epochs of maritime discovery and colonization, when the seamen who achieved the

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brilliant successes which established England's claim to the sovereignty of the seas, came from the Merchant Service; and they are spoken of as mere adventurers—men without training, or much knowledge, but possessed of more than an ordinary share of daring, courage and endurance. Of the physical qualities the earlier generations of navigators, and their companions in adventure, had no stint; but to these were superadded an amount of energy and enthusiasm not now so generally found in the same class. In other respects those men are entirely misunderstood by their brethren of to-day, for as regards literary and scientifi culture they took a high position in the age in which they lived,—leaving their mark on it not only through their geographical discoveries, but through their inventions and improvements in the art of navigation; and not a few were strong advocates of a system of training and instruction for seamen.

JAPANESE COMMERCE IN THE PAST AND PRESENT.

JAPAN has been not inaptly termed "Asiatic Great Britain." Like our own dear islands, its natural features and geographical position qualify it for the enjoyment of an extensive commerce and a large measure of prosperity. Situated at a comparatively short distance from the Chinese mainland—with a vast population, far larger than that of Continental Europe, and lying in a temperate zone, nature has evidently destined these islands to be eventually famous—perhaps as famous as our own. In many respects the two countries have a resemblance to each other. Both consist of principal and numerous inconsequential islands: but, whereas Japan proper comprehends Nipon, Kiusiu, Sikok and Yesso, Great Britain is divided into two chief islands only. Moreover, each comprises as well a large number of smaller islands and islets. But these are by no means the only points of similarity. The coast line of Nipon is indented by many magnificent harbours and navigable rivers,

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fitting it in every way to become a great shipping centre. Isolation from the mainland largely shelters these islands from the dangers of invasion, and secures to their people that protection of life and property, and stability of government, without which great commercial prosperity is unattainable. In the next place, the area of Nipon, together with the three next largest islands is about the same as that of Great Britain and Ireland combined, while in the matter of population there is equally very little to choose between the two kingdoms. Again, in their natural characteristics, both are strikingly similar. Both are mountainous in parts; both are exceedingly rich in coal, iron, copper, lead, sulphur and other mineral products, though probably on the whole Japan has the advantage of ourselves in possessing unlimited supplies of gold and silver, which only require proper working to seriously affect the bi-metallic question. In Nipon, the England of Japan, the country side is generally of moderate elevation. Hill, not mountain, ranges are there intermingled with fertile valleys, watered by running streams and smooth rivers, forming the most pleasing landscapes, while here and there a giant mountain towers in the sky. The description would almost do for home, more particularly so when we add that the soil is everywhere fertile and teems with a great variety of agricultural produce; that wild animals and reptiles are practically unknown, except in the extreme north, and that horses, oxen, cows, dogs and deer are the chief domesticated animals. Moreover, unlike most Asiatic races, the inhabitants of Japan are industrious and enterprising; exceptionally quick in receiving new ideas, and bowing to the inevitable. Having once started upon the road of progress, there is no saying where they will stop. In their facility to accept the teachings of experience they rival Europeans, while, and what is of even more importance still, a lesson once learnt seems never forgotten. They also compare with the British in another respect. Those who have had frequent opportunities of conversing with educated members of their community will agree in appreciating their linguistic powers, which enables them very readily to imitate the manners and customs of Westernism and to imbibe its ideas. Bearing these facts in mind and

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remembering that the first important commercial treaty with the Tycoon was signed so recently as August 26, 1858, it does not seem exaggerating the prospects of the situation to anticipate for the Japanese of next century a commerce and enlightenment surpassing that of many European Powers.

What large results have been accomplished in the past twenty years! From a nation with scarce any foreign trade whatever, Japan has sprung up into an important position by real "leaps and bounds." When spoken of these people the well-used metaphor loses its force: it is simply the truth. Their commerce with the rest of the world has positively risen by leaps and bounds. No less ambitious words can fairly illustrate the astonishing progress made during the last few decades. Half-a-century ago the foreign trade of Japan was utterly contemptible: it was limited entirely to small exchanges with the Dutch and Chinese, all other foreigners being vigorously excluded. The former were then permitted to visit Nagasaki—the only port open—with two ships yearly, and the latter with five times as many junks. What the trade was with the latter we know not for certain, but with the Dutch it was valued at 373,853 florins for exports, and 868,482 florins for imports. In other words, the whole value of the outward and inward commerce with Europe at that time scarcely amounted to £100,000. Even so recently as 1860, the value was barely over twelve hundred thousand pounds, the total imports being £448,000, and exports £762,000. This was the first year that intercourse with British subjects was legalized. By Article III. of the Yeddo Treaty, alluded to above, the ports of Hakodati, Kanagawa, and Nagasaki were thrown open to us from the 1st of July, 1859. By the same Article, Niigata, or another suitable port on the west coast of Nipon, was to be opened on January 1st, 1860, and Hiôgo on the same day in the third year following. Practically then, 1860 was the first complete year of our commercial communion with the Land of the Rising Sun, and, indeed, may be considered the second starting point of Japanese progress. Prior to our treaty being signed, the Americans had forced these "would be" exclusionists to buy their goods,—unequivocally at the sword's point. The "Commodore Perry Expedition" resulted in a treaty of

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commerce being signed with the United States on March 31, 1854, or some four or five years before we obtained a footing. What a debt of gratitude the world owes to that energetic commander! To his "not-to-be-denied" manner of negotiation, the unarmed and frightened natives dared offer no forcible resistance. Finding he was determined and that his Government had no intention to submit to the indignities which the Dutch had swallowed, they wisely did the next best thing and conciliated a force they dared not oppose. It does not seem, however, that the exchanges between the two countries were at all considerable until many years afterwards; indeed, the contrary is apparent from an examination of official documents published at Washington. It was not until the year 1864 that Japan entered upon any important intercourse with the outside world, but when she did, it was with a vengeance. In the year 1867 trade was in full swing. At Hakodati, the imports were then valued at 218,558 dollars, and the exports at 638,860 dollars, showing an increase over the previous year of 187,645 dollars and 97,562 dollars respectively. Of this trade more than one-half was carried in British ships; while out of a total foreign tonnage of 18,110 inwards and 17,801 outwards engaged, 7,602 and 6,722 tons respectively belonged to this nation. American shipping came second with 4,391 tons inwards and 4,829 tons outward, and Prussia third with 3,814 both ways; the remainder being divided between the French, Dutch, Russian and Danish flags in the order named. Altogether sixty vessels were then employed on foreign account, of which 29 were English, 13 American and 11 Prussian.

At Nagasaki, the importation nearly doubled between the same periods increasing from 2,663,336 dollars in 1866 to 5,248,987 dollars, while the exports showed a slight falling off from 1,995,328 to 1,775,907 dollars. A glance at the tonnage returns records the rapidity with which commerce now expanded, the gross tonnage employed in the inward trade rising from 67,267 tons in the former year to 105,213 in the latter. At Kanagawa, the chief port, the enterings represented 174,837 tons against 74,088 tons in 1875, the figures for 1876 being unobtainable through the destruction of the Custom House records. These few comparisons

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show at what rate these people were imbibing western ideas and how gladly they, as a race, availed themselves of the opportunity of foreign communion hitherto denied them through the perversity of their rulers.

It was about two years prior to this that the Japanese contemplated the prospect of becoming a maritime power. Now as a matter of fact they are so. Not then possessing the means or knowledge to build vessels for themselves, they bought of us and other foreigners. In 1866, the value of the ships sold to them was estimated at about 1,200,000 dollars; while their purchases in the following twelve months were of about an equivalent value. For this sum they obtained, in the latter year, 10 British steamers and 11 sailing vessels of small burden, besides three American and one Dutch vessel. Their most important purchases were the s.s. *Nepaul*, 541, bought for 167,500 Mexican dollars, the s.s. *Shooeyleen*, 492 tons, the s.s. *Keangsoo*, 448 tons, the s.s. *Carthage*, 500 tons, and the *Coquette* 459 tons. Although fairly numerous even at that time, the modern Japanese fleet was not distinguished for the size of its vessels, nor, for the matter of that, for its quality either. Comparatively high prices were given for our "cast-off's," but only one or two were found good for anything else but coasting purposes. One reason for the large sums asked was the long credit demanded by purchasers, the natives thus early imitating Europeans in their habit of running into debt. But whether this had anything to do, or not, with their being compelled to "pay through the nose," the fact remains that in most cases these shrewd islanders were done. For the first few seasons the "new belongings" were engaged in the local trade only, plying between Nagasaki and the various surrounding ports, and it was not until some years afterwards that a competition was commenced against us in the Chinese seas.

How plainly "coming events had cast their shadows before" will be seen from the following extracts from Mr. Marcus Flower's Consular Report, for the year 1867:—"The natives," he remarked, "evince the most ardent desire to trade with foreigners, and to exchange commodities, that they only want the opportunity afforded them. They are already beginning to appreciate the

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value of foreign intercourse, and in a short time, I have no doubt, we shall see them introducing all the appliances of civilization. So anxious are they to learn, that there is not a single steamer that enters the harbour but they are sure to visit and take minute copies of everything they see, and such rapid progress have they made with regard to machinery, that they are able to work all the steamers they have recently purchased themselves." "The people," he adds, "are quick and intelligent, and it is a rare thing to meet with a native that cannot read or write." These words were written in 1868, or about fourteen years ago, but even thus early in the lifetime of revolutionized Japan, it was evident to all observers that this imitative and quick-witted race would take kindly to a seafaring life. Great promises—since amply redeemed—were vouchsafed on their behalf, and it cannot be said that those who made them have much reason to feel dissatisfied with their judgment.

There can be little doubt that at one time in their history the Niphons were addicted to commercial pursuits, and made frequent trading visits to the mainland, especially to that part of China known as the Corean peninsula, but from the beginning of the seventeenth century, when the Portuguese were finally expelled, all intercourse with strangers was interdicted. Only two Dutch ships and ten Chinese junks, as said before, visited their shores in the course of a year, while, as a rule, the only occasions on which the junks of Japan sought the Chinese coast was when driven there by stress of weather. However, the necessities of intercommunication—through the various portions of the Empire being separated by water—maintained among these islanders that maritime spirit which had done so much to enfame their earlier history, and when the hour for enlightenment and progress arrived, it found a people hardy and enterprising, inured from childbirth to a seafaring life, and only too willing to learn and adopt the improvements of other nations.

So rapid was the progress made, when once the first step had been taken, that by 1872, Japanese steamers were actually visiting the coasts of China. For that period the total entrances and clearances, as recorded in the Reports of Trade at the Treaty Ports,

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published by the Chinese Imperial Maritime Customs, were 14 vessels and 5,108 tons. During the two succeeding years the novel flag was seldom seen in those waters, but in 1875 commerce between the two Empires burst into full activity. The tonnage entered and cleared rose at a bound to 96,513, then to 117,134 in 1876, falling to 115,263 in the year following; then rising again to 123,887 tons in 1878, and to 138,208 in 1879. From that point it suddenly jumped up to 167,902 tons in 1880, no fewer than 201 vessels being registered, while last year again witnessed a material improvement. A glance at the Customs' Gazettes for the first two quarters of the current twelvemonth reveals another marked rise. At Shanghai alone out of 997 steamers entered, no fewer than 143 carried the Japanese flag, whilst at Tientsin, Newchwang, Chefoo, Amoy, Swatow and the Formosan ports, their vessels were no infrequent or unwelcome visitors.

In another way we can arrive at the extraordinary development which has been taking place in the foreign trade of these people. It appears that in 1874 they only accounted for ·01 per cent. of the total value of exports and imports at the Chinese ports, whereas, in 1879, the proportion falling to their share had risen to the respectable figure of 4·26 per cent. At present it largely exceeds 5 per cent., and probably when the returns are completed for the passing year, we shall find Japan running France a close rivalry for second place in the Chinese trade. Moreover, we venture to prophesy that the closing days of this decade will see that country second only to Great Britain, if, indeed, it has not usurped the foremost place in this lucrative commerce.

F. N. NEWCOME.

(*To be continued.*)

ERRATUM.—In our notice of Bahia Blanca and Port Belgrano in the November number, page 883, for "the Republic of Uruguay" read "the Argentine Republic."

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MERCANTILE MARINE OFFICES.

A NEW Mercantile Marine Office was opened at Newport, Mon., in October last. It is situated in Dock Street, about 200 yards from the top of the Old Dock, and about the same distance from the Custom House, being about midway between each. The seamen shipped and discharged at this port were in—

	Total.
1866	4,637
1879	14,784
1881	16,600

This year (1882) the number will probably reach 18,000. This expansion of business is likely to go on at that port. The Alexandra Dock Company obtained powers last Session of Parliament to extend their system very considerably. The Old Dock Company are talking of enlarging their powers next Session, whilst the Harbour Commissioners are considering the question of getting extended powers for the better government and improvement of the river.

The Board of Trade have the sole control of the Newport staff, having separated it from the Customs some time ago. The new staff consists of—Superintendent; 2 deputy superintendents; 2 clerks; 1 inspector, out-door; 3 constable-messengers; 1 porter.

This building adds one more to a number that have been built or rebuilt under the auspices of the Marine Department of the Board of Trade. Special care seems to be exercised in facilitating the transaction of a business which, owing to the vast increase in the number of steam-vessels, require the utmost despatch and correctness. The seamen are protected in such a way when entering into their engagements with shipmasters, that no ulterior influence is allowed to come near them. The increase of the Mercantile Marine Office staff expedites the clerical work indoors, and outside gives great assistance to the regular despatch of ships, and the "transmission scheme," which is in full operation, enables the sailors at the close of their engagements to proceed to their homes at once.

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MERCHANT SHIPPING (COLONIAL INQUIRIES) ACT, 1882.*
(45 & 46 Vict., Chap. 76.)

Chapter 76.

An Act to amend the Merchant Shipping Acts, 1854 to 1880, with respect to Colonial Courts of Inquiry. (18th *August*, 1882.)

WHEREAS it is expedient to amend the Merchant Shipping Acts, 1854 to 1880 (17 & 18 Vict., c. 104, &c.), with respect to inquiries held in British possessions abroad into charges of incompetency or misconduct on the part of masters, mates, or engineers of ships, or into shipwrecks or other casualties affecting ships:—

Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

1. *Short Title.*—This Act may be cited as the Merchant Shipping (Colonial Inquiries) Act, 1882.

2. *Construction of Act.*—This Act shall be construed as one with the Merchant Shipping Act, 1854, and the Acts amending the same, and the said Acts and this Act may be cited collectively as the Merchant Shipping Acts, 1854 to 1882.

3. *Colonial courts or tribunals to have jurisdiction to make inquiry into charges of misconduct or incompetency and shipping casualties in certain cases occurring outside the limits of the colony.*—Every court or tribunal which is already authorised or which may hereafter be authorised by the legislative authority in any British possession to make inquiry into charges of incompetency or misconduct on the part of masters, mates, or engineers of ships, or as to shipwrecks or other casualties affecting ships, shall in the cases following; that is to say,

* The Act as printed on page 718 is inaccurate.

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I. When the incompetency or misconduct has occurred on board of a British ship on or near the coasts of the British possession or on board of a British ship in the course of a voyage to a port within the British possession:

II. When the incompetency or misconduct has occurred in any part of the world on board a British ship registered in the British possession:

III. When the shipwreck or casualty occurs to a British ship on or near the coasts of the British possession or to a British ship in the course of a voyage to a port within the British possession:

IV. When the shipwreck or casualty occurs in any part of the world to a British ship registered in the British possession:

V. When the master, mate, or engineer of a British ship who is charged with incompetency or misconduct on board of such British ship is found in the British possession:

VI. When some of the crew of a British ship which has been wrecked or to which a casualty has occurred, and who are competent witnesses to the facts, are found in the British possession;

wherever the incompetency, misconduct, shipwreck, or casualty has occurred, have the same jurisdiction as such court or tribunal would have had if such incompetency, misconduct, shipwreck, or casualty had occurred within the ordinary jurisdiction of such court or tribunal, but subject to all provisions, restrictions, and conditions which would have been applicable if they had so occurred: Provided that no inquiry shall be held under this Act into any shipwreck, or other casualty, or charge of incompetency or misconduct, which has once been the subject of such an inquiry and has been reported on by any competent court or tribunal in any part of Her Majesty's dominions, or in respect of which the certificate of a master, mate, or engineer has been suspended or cancelled by a naval court; and provided also, that where any inquiry has been commenced in the United Kingdom no inquiry shall be made in the same case under the authority of this Act in any British possession.

In all the above cases the "British possession" shall mean the

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British possession by the legislative authority whereof the court or tribunal is authorised to make inquiry.

4. *Colonial legislative authorities empowered to authorise inquiries into shipping casualties and charges of misconduct and incompetency in certain cases.*—The legislative authority in any British possession is hereby empowered to authorise courts or tribunals to make inquiries in the cases enumerated in the last preceding section of this Act into charges of incompetency or misconduct on the part of masters, mates, or engineers of ships, or as to shipwrecks or other casualties affecting ships, subject to the provisions in the last preceding section of this Act mentioned.

5. *Suspension or cancellation of certificates.*—The powers of suspending or cancelling the certificate of any master, mate, or engineer of a ship, conferred by the provisions of the Merchant Shipping Acts, 1854 to 1880, upon or after any inquiry or investigation held under the provisions of the said Acts, shall be applicable to and be exercised upon or after any inquiry by any court or tribunal authorised by this Act, or authorised by the legislative authority of any British possession under the powers conferred by this Act. Such power of suspension or cancellation shall be exercised by the Court or tribunal holding the inquiry in the manner provided by section twenty-three of the Merchant Shipping Act Amendment Act, 1862 (25 & 26 Vict., c. 63), and the Board of Trade shall in such cases have all the powers conferred upon them by the said section.

6. *Appeal from colonial courts.*—Whenever any inquiry authorised by or in pursuance of this Act has been held, a rehearing of the case may be ordered, and if an application for such rehearing has not been made or has been refused, an appeal shall lie from any order of finding of the court or tribunal holding such inquiry to the following court, namely, the Probate, Divorce, and Admiralty Division of Her Majesty's High Court of Justice in England.

Provided always, that no appeal shall lie from any order or finding in an inquiry into a casualty affecting a ship registered in a British possession, or from any decision respecting the suspension or cancellation of the certificate of a master, mate, or engineer, unless such certificate has been granted under the authority of the Merchant Shipping Act, 1854, or any Act amending the same, or

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of the Merchant Shipping Colonial Act, 1869 (32 & 33 Vict., c. 11).

Any such appeal shall be subject to and conducted in accordance with such conditions and regulations as may from time to time be prescribed by general rules made under section thirty of the Merchant Shipping Act, 1876 (39 & 40 Vict., c. 80).

7. *Repeal of part of* 17 & 18 *Vict., c.* 104, *s.* 242.—The words "and such report is confirmed by the governor or persons administering the government of such possession" in case (V.) of the cases enumerated in section two hundred and forty-two of the Merchant Shipping Act, 1854, are hereby repealed, and this repeal shall be deemed to take effect as if the said words had been expressly repealed by the Merchant Shipping Act Amendment Act, 1862. The confirmation of the report required by the said words shall be deemed to have been no longer necessary after the passing of the Merchant Shipping Act Amendment Act, 1862, as a condition precedent to the suspension or cancellation of the certificate of any master, mate, or engineer.

CORRESPONDENCE.

SCREW STEAMERS IN A GALE.

To the Editor of the "Nautical Magazine."

Sir,—I must apologise for occupying your space for a few more words on the above subject, for it appears to me that the letter in the July number answers everything that has appeared in the Magazine from experienced masters or officers of screw steamships, criticising adversely the theory submitted in the March letter.

We have, however, been favoured with a letter of five pages in the July number, and as many more in September, from your correspondent "B. O. T.," or "B. W.," both of which no doubt contained most valuable information for those about to take command of a sailing ship for the first time; but, as the writer's whole experience in screw steamships, according

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to his own account, is limited to one passage across the Bay of Biscay "in a steamship of 800 tons register," whether as an officer or passenger he has not told us, I do not think his theory of their management can benefit those who have had from ten to twenty years' practice in steamers in this trade. The extraordinary behaviour of that screw steamship under the circumstances described, cannot be sufficiently admired by anyone who has passed safely through half-a-dozen such gales as the one encountered last November, with more or less damage to some of the finest ships in the Atlantic service; but I certainly must agree with Captain Kiddle, in the August number, that it "will astonish men who in ships of six or seven hundred nominal horse-power, to perform a like feat are compelled to use all the power that the engineer deems compatible with safety to the machinery." I trust I may be pardoned for saying that your correspondent "B. W., master for 33 years," with only the experience of one passage in a screw steamship, is hardly qualified to make the statement he does on page 692, that "from the action of the waves, the management I maintain is pretty much the same in sail and steam in all cases;" and also for submitting that the statement on pages 693 and 694, "I cannot understand why this position should be more natural to a screw-steamer than any other vessel," is much more creditable to his modesty than the one on page 696, where he states in contradiction to the experience of three of your correspondents that have seen from fifteen to twenty years' service in screw-steamers, that "I do not believe in this natural position, here quoted, which a screw-steamer takes up when stopped." On page 525 your correspondent writes as follows: "In proof of this, if my memory serves me rightly, the *Great Eastern* was handled as a mere toy—a plaything under these circumstances—powerless in the trough of the sea." If his memory had "served him rightly," he would have remembered that the *Great Eastern* was not only a screw steamship, but a screw and paddle steamship; and instead of having a "drogue" only, at one end, had two immense paddles amidships, either of which would have overcome the natural tendency of the screw to keep the ship's stern to the wind and sea. Fair and impartial criticism by experienced men should be sought on this

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subject, not long-winded dissertations on the time to bring a sailing ship to when running, or when to keep her off after having been hove-to; what is of real value is the experience of practical steamship masters, not the theories of sailing ship captains, no matter of how many years' standing, who probably become more incapacitated from giving an opinion on the management of steamers every year that they continue to command sailing ships.

It is almost unnecessary to repeat what anyone with the slightest knowledge of a screw steamship is cognizant of: that with the engines stopped and the screw attached, it is simply impossible to bring the wind and sea before the beam in heavy weather. In Captain Malet's letter we have an excellent illustration of the possible result of attempting to steam head into an Atlantic hurricane in ships of more than moderate power, and from the letters of Captain Kiddle and Captain Lecky, we have valuable evidence as to the behaviour of a screw steamship when stopped under the same circumstances. The evidence of the last-named gentlemen can be corroborated by the experience of a dozen others, some of them among the oldest masters in this service, who do not hesitate to give personal testimony in favour of the admirable behaviour of steamers which they have commanded, when stopped in heavy gales, but who for some reason are unwilling to write upon the subject.

Thanking you for having published my letters, which were written not for "literary fame," but in the hope that the writer's experience might be of some little benefit to those in command of screw steamships "when serious damage was apprehended,"

I am, Sir, your obedient servant,

Liverpool, October 28, 1882. J. W. SHACKFORD.

SCREW STEAMERS IN A GALE.

To the Editor of the "Nautical Magazine."

Dear Sir,—The letter of your correspondent in the September issue, relative to the question late in discussion of heaving-to in

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heavy weather, bears so importantly in some of its points on the manœuvre of running as well as lying-to, that I must request your permission to grant me space for the following remarks if you do not consider the subject already worn threadbare: To guard against too wide a practical application to Captain Shackford's new theory (which must have resulted in disaster to vessels of a certain class) that a screw steamer's natural position when stopped in a gale of wind is to lie with her quarter to the sea, or words to that effect, first induced me to express my opinion on the subject in your June number, an opinion which I now repeat, viz.: that his sweeping assertion must be taken "*cum grano salis*," as what holds good in one instance may not do so in all. From letters of your other correspondents I think this is now fully acknowledged. Captain Kiddle's own experience "in a small steamer well down in the water" although given to bear out the quarter theory, seems itself rather to refute it—here the engines were stopped and a new main-staysail set." Why the main-staysail, if the ship naturally inclined with her quarter to the sea? rather head sail to keep her so: We must infer in this case that the ship rode with the wind and sea before the beam; this I affirm is quite possible in vessels of a certain build with engines stopped, under canvas, or working at a low rate of speed, although my own experience and the "Anecdote" of the little craft of 800 tons, bowing the sea with propeller going easy, and fore-and-aft sail set, seems to excite astonishment or incredulity in your correspondent of August, who appears to have overlooked the fact that the vessels of six or seven hundred nominal horse-power, which had to be fully exerted to keep them to the sea, can bear no comparison with the shorter vessels referred to.

The natural position of a steamer with machinery stopped or disabled in a seaway, depends altogether on the construction and length of hull, rig, trim, and perhaps (as regards steadiness) metacentric height of the vessel involved. In long steamers, whose fore-gripe is small, to lend fuller command to the helm, the tendency —especially if trimmed by the stern—will naturally be to fall off, bringing the wind and sea abaft the beam; not so in finely-modelled high-pooped vessels with long forefoot, whose inclination under

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canvas will be to bow the sea, or, according to the masting, under bare poles to fall atrough. Ordinary cargo vessels built with no consideration as to seaworthiness, disposition of masts (save as regards facility for discharging or loading cargo), or aught else, except carrying capacity, and in some instances, strength—lumbering warehouses, in fact, with no claim to beauty of naval architecture—these vessels I repeat, low in the bilge, with no fine ends, will almost invariably lie atrough. I leave it to those who have had experience in such to confirm or refute this.

Coming now to the question of running, I wish briefly to refer to the paragraph in your September correspondent's letter :—"Is a ship in greater safety when left to drift only, to clear a high, fast, running sea, than when she is pressed forward by sail or steam at a good rate of speed ?" My answer to this is, decidedly so (always ignoring danger to rudder and propeller), if the ship can be kept end on to the sea, or nearly so.

In explanation, we must inquire "what constitutes the danger in heavy running ?" Firstly, being pooped, secondly, broaching-to while running at a high rate of speed, through accident to steering gear, inattention, or any other cause; the latter needs no comment. As regards the first disaster, what is the cause ? The general answer appears to be "because the ship has not had sufficient headway to clear the sea," we must add, "or she has had too much to allow the sea to clear her." What has to be avoided when running heavy in a vessel of great length is *settling amidships in a sea*, and while in that position,—speed and buoyancy being naturally at a minimum,—being pooped by the following sea, which sweeps with resistless destruction its immense volume her whole length. This condition is obtained when velocity of ship and waves are at par, and herein lies the danger to be avoided. The velocity of the great waves of the Atlantic is acknowledged to average about nine knots, hence the most dangerous speed when running is that rate, which small powered steamers can seldom exceed, even with the aid of canvas when practicable. When greater than this speed cannot be attained, then slow down to steerage way if you do not fear

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damage to rudder of propeller, or heave-to bow to sea in the old orthodox style.

Yours obediently,

S.S. *Marengo*, Hull, J. H. MALET.
14th September, 1882.

SHIPBUILDING, 1882.

IRON AND STEEL STEAMERS BUILT IN THE UNITED KINGDOM, AND REGISTERED AS BRITISH SHIPS DURING THE SECOND AND THIRD QUARTERS OF 1882.

Ports where Built.	No. second quarter.	Gross Tonnage second quarter.	No. third quarter.	Gross Tonnage third quarter.
Clyde Ports ...	28	47,581	42	55,523
Tyne Ports ...	29	45,822	25	41,040
Sunderland ...	20	38,662	20	37,232
The Hartlepools	10	17,197	9	15,586
Middlesbro' ...	3	5,742	5	6,524
Stockton ...	5	9,632	4	8,244
Whitby ...	3	4,380	1	1,751
London ...	5	620	8	4,728
Liverpool ...	1	128	3	7,023
Barrow ...	5	14,156	6	13,803
Belfast ...	4	6,371	3	4,850
Hull ...	2	473	6	10,411
Cumberland Ports	2	1,907	—	—
Aberdeen ...	1	1,537	—	—
Grangemouth	2	476	—	—
Dundee ...	2	2,079	1	760
Leith ...	4	5,328	2	3,065
Kirkcaldy ...	1	3,405	—	—
Other Ports ...	4	465	8	3,136
Total ...	181	205,961	143	213,676

Total for the first nine months of 1882 ... ... No. 871, Gross Tonnage 580,972

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STEEL STEAMERS BUILT IN THE UNITED KINGDOM AND REGISTERED AS BRITISH SHIPS DURING THE SECOND AND THIRD QUARTERS OF 1882.

Ports where Built.	No. Second quarter.	Gross Tonnage second quarter.	No. third quarter.	Gross Tonnage third quarter.
Clyde Ports ...	6	15,778	12	16,440
Tyne Ports ...	1	65	—	—
London ...	2	42	4	2,287
Barrow ...	2	7,920	—	—
Belfast ...	2	5,674	—	—
Hull ...	—	—	1	1,695
Grangemouth	1	56	—	—
Leith ...	1	1,640	—	—
Other Ports ...	—	—	1	35
Total ...	15	31,175	18	20,457

Total for the first nine months of 1882 ... ... No. 43, Gross Tonnage 79,019

IRON AND STEEL SAILING SHIPS BUILT IN THE UNITED KINGDOM AND REGISTERED AS BRITISH SHIPS DURING THE SECOND AND THIRD QUARTERS OF 1882.

Ports where Built.	No. Second quarter.	Gross Tonnage second quarter.	No. third quarter.	Gross Tonnage third quarter.
Clyde Ports ...	9	13,032	12	19,300
Tyne Ports ...	—	—	1	251
Sunderland ...	1	1,529	2	3,341
Liverpool ...	2	3,944	5	9,958
Southampton	1	1,997	—	—
Aberdeen ...	—	—	1	2,212
Cumberland Ports	—	—	2	3,097
Belfast ...	2	2,424	1	2,518
London ...	2	270	1	65
Total ...	17	23,196	25	40,743

Total for the first nine months of 1882 ... ... No. 65, Gross Tonnage 89,817

Of the total for the nine months only four ships with an aggregate gross tonnage of 5,894 were steel.

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BOOKS RECEIVED.

The Danger Angle, and Off-Shore Distance Tables. By Captain S. T. A. S. Lecky, Lieut. R.N.R., F.R.A.S., F.R.G.S. London: George Philip & Son. 1882.

The origin of these tables is undoubtedly Snare's "Tables for ascertaining a ship's distance from high land," and Becher's "Tables of mast-head angles," both exceedingly useful, but never appreciated. Captain Lecky has made use of both, but considerably simplified them on the basis of the rule given in Raper's "Navigation," so that now whatever distance a ship is from visible land, it becomes a mere matter of inspection to ascertain what that distance is. Part I. includes heights from 50 to 1,000 feet, and distances from the tenth of a mile to five miles; Part II. is for greater heights and distances. No doubt the computation of the tables must have been tedious work, for a lengthened period; let us hope, therefore, that Captain Lecky may be more fortunate than his predecessors, and that he may realise some profit from the publication of a work which shipmasters will find it to their advantage to possess.

Atlantischer Ozean. Ein Atlas von 36 *Karten, die physikalischen Verhältnisse und die Verkehrs-Strassen darstellend, &c.* Hamburg: L. Friederichsen & Co. 1882.

This work, issued under the auspices of the well known "Deutsche Seewarte," and edited by their Director, Dr. Neumayer, is an Atlas of the physical geography of the Atlantic Ocean. It consists of 36 charts; and on these are clearly delineated the various physical phenomena of that ocean, grasping everything relating to the air and the water for the seasons, and for the mean of the year; the Atlantic depths and currents are especially well shown, as are also the variation, inclination, and horizontal intensity of the magnetic needle; the great circle routes, as well as the routes taken by steamers and sailing vessels across and through the Atlantic are distinctly marked, and the distance attached to each. Not the least

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valuable part of the work is the introduction, in which each chart is carefully described, and a summary given of the latest information on meteorology and oceanic phenomena.

Observations on the Rule of the Road at Sea; prepared for and dedicated to officers and seamen of the Mercantile Marine. By Thomas Gray, author of the *Rules in Rhyme*. Third edition and Fifth Thousand. London: J. D. Potter and Pewtress & Co. 1882.

THEY who wish to know all about the Rule of the Road at Sea, Ships' Lights, and other special regulations connected therewith, should possess a copy of Mr. Gray's "Observations," and always have it handy for reference. It is so good a work on the subject that it is not surprising a third edition is required, nor that the sale has reached the thousands indicated. If it were studied as it ought to be, and its instructions acted upon, the number of collisions would be many less than now occur.

Rudimentary Astronomy (*Weales Rudimentary Series*), by the late Rev. Robert Main, formerly Radcliffe Observer at Oxford; Third Edition, revised and corrected to the present time by William Thynne Lynn, B.A., F.R.A.S. London: Crosby, Lockwood & Co. 1882.

SUCH of our readers as take an interest in the subject, will find, in this rudimentary treatise, at the price of 2s., as much information on Practical and Physical Astronomy, and the instruments used in connection with that science, as is to be found in a much more pretentious volume. It was written by an able and practical man, an astronomer well acquainted with observatory work, and capable of communicating his knowledge in a popular form. The chief labour of the present editor has been to bring the treatise up to date; this he has efficiently done.

OUR LIBRARY TABLE.

The usual *Notices to Mariners* and *Hydrographic Notices*, British and Foreign, are to hand, and their substance transferred to our pages. The books, pamphlets and papers on our table are as follow: *Tables relating to Life Salvage on the Coasts of the United*

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Kingdom, issued by the Board of Trade, bring up our information on an important subject to the end of June, 1882, and furnish us also with an appendix respecting the means and appliances for saving life from shipwreck in the British Colonies and Possessions. The quarterly number of *The Shipwrecked Mariner*, with its excellent illustrations, is full of interesting and useful reading, and the list of "Great Gales" is continued. The Meteorological Office has published Part III. of *Contributions to the Knowledge of the Meteorology of the Arctic Regions*, and a *Report on the Gales experienced in the Ocean District adjacent to the Cape of Good Hope*, by Captain H. Toynbee, F.R.A.S.; the latter is the concluding part of the work we noticed in the November number of the *Nautical Magazine*, and we shall give a synopsis of it in our next. *Van Nostrand's Engineering Magazine* (New York) for November, gives a summary of a lecture by Prof. W. A. Rogers, on the "Co-efficient of Safety in Navigation." The U.S. Hydrographic Office has recently published charts of the *River Manaos* on a large scale, in six sheets; and a *Circumpolar* (*Arctic*) *Chart* in two large sheets, abounding in physical data. *Annalen der Hydrographie und Maritimen Meteorologie*, Heft X. *Rivista Marittima* (Rome) for November, gives the fifth paper of an able series on "Naval Tactics," by Admiral Fincati; also an article on the cost of the Italian Navy; and a continuation of Professor Busin's "Investigation of the Physics of the Cyclone." *Boletin de la Sociedad Geográfica de Madrid* for October has a good paper (to be continued) on Tahiti, and a curious old map (with description) of Guatemala and Nicaragua. *Revista Maritima Brazileira* (Rio de Janeiro) for August and September, the former month's number giving a synopsis of the New Method of Navigation. The latest numbers of *Hansa*, *Das Schiff*, *Le Yacht*, *Forest and Stream* (U.S.), the *New York Maritime Register*, the *Nautical Gazette* (U.S.), and *L'Avenir Militaire* (Paris) are also to hand.

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TIDE TABLES FOR DECEMBER, 1882.

Also Ports of Reference for the Constants in the next Table.

WEEK DAY.	MONTH DAY.	LONDON BRIDGE.		HULL.		NORTH SHIELDS		LEITH.		DEVONPORT.		DOVER.		WESTON-SUPER-MARE.		LIVERPOOL.		GREENOCK.		QUEENSTOWN.		KINGSTOWN.		LONDONDERRY.		BREST.	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
		H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
F	1	5 48	6 9	10 26	10 51	7 21	7 49	6 20	6 45	9 20	9 41	2 58	3 20	10 29	10 49	2 52	3 14	3 42	4 3	8 53	9 14	2 53	3 16	—	0 11	7 41	8 4
S	2	6 32	6 59	11 19	11 49	8 16	8 45	7 11	7 39	10 4	10 29	3 42	4 4	11 10	11 36	3 38	4 4	4 26	4 50	9 35	10 0	3 41	4 9	0 43	1 17	8 28	8 56
S	3	7 21	7 50	—	0 20	9 16	9 50	8 9	8 43	10 57	11 27	4 28	4 55	—	0 6	4 34	5 8	5 17	5 47	10 30	11 4	4 39	5 10	1 53	2 28	9 28	10 2
M	4	8 20	8 53	0 51	1 22	10 24	10 56	9 18	9 51	—	noon	5 24	5 54	0 38	1 11	5 44	6 20	6 19	6 51	11 37	—	5 41	6 12	3 1	3 31	10 36	11 10
T	5	9 32	10 4	1 52	2 22	11 27	11 57	10 22	10 52	0 35	1 9	6 25	6 57	1 44	2 18	6 53	7 25	7 23	7 56	0 10	0 48	6 42	7 12	3 58	4 24	11 44	—
W	6	10 37	11 7	2 52	3 21	—	0 26	11 20	11 46	1 43	2 16	7 29	8 0	2 51	3 24	7 56	8 24	8 24	8 58	1 15	1 46	7 41	8 9	4 48	5 9	0 16	0 45
Th	7	11 36	Mid.	3 48	4 13	0 52	1 15	—	0 9	2 45	3 10	8 26	8 48	3 54	4 22	8 48	9 9	9 21	9 46	2 14	2 38	8 35	8 59	5 29	5 49	1 10	1 33
F	8	—	0 25	4 36	4 56	1 35	1 55	0 29	0 49	3 35	3 59	9 10	9 32	4 48	5 12	9 29	9 48	10 8	10 30	3 1	3 23	9 22	9 43	6 9	6 29	1 54	2 13
S	9	0 45	1 6	5 16	5 36	2 14	2 33	1 9	1 29	4 22	4 44	9 54	10 16	5 35	5 58	10 7	10 27	10 51	11 12	3 44	4 5	10 1	10 19	6 49	7 9	2 32	2 52
S	10	1 28	1 47	5 56	6 16	2 51	3 9	1 48	2 7	5 5	5 25	10 38	11 0	6 20	6 41	10 47	11 7	11 33	11 54	4 26	4 47	10 38	10 57	7 29	7 49	3 12	3 32
M	11	2 5	2 23	6 36	6 56	3 28	3 48	2 26	2 45	5 47	6 5	11 21	11 42	7 2	7 22	11 27	11 47	—	0 15	5 8	5 29	11 16	11 36	8 8	8 27	3 52	4 12
T	12	2 42	3 2	7 16	7 36	4 8	4 28	3 4	3 23	6 25	6 45	—	0 4	7 42	8 2	—	0 7	0 36	0 57	5 50	6 10	11 56	—	8 45	9 3	4 32	4 52
W	13	3 21	3 41	7 56	8 16	4 49	5 10	3 43	4 3	7 4	7 23	0 26	0 48	8 22	8 42	0 27	0 48	1 18	1 38	6 30	6 51	0 17	0 38	9 22	9 42	5 12	5 32
Th	14	4 2	4 21	8 37	8 58	5 31	5 52	4 25	4 47	7 44	8 6	1 10	1 32	9 2	9 22	1 9	1 30	1 58	2 19	7 12	7 34	1 0	1 22	10 2	10 24	5 52	6 15
F	15	4 45	5 8	9 21	9 45	6 16	6 40	5 10	5 35	8 25	8 50	1 56	2 20	9 42	10 2	1 51	2 14	2 41	3 4	7 56	8 19	1 45	2 10	10 48	11 10	6 39	7 3
S	16	5 30	5 53	10 9	10 35	7 5	7 23	6 2	6 30	9 12	9 36	2 45	3 10	10 22	10 43	2 38	3 3	3 27	3 52	8 42	9 6	2 35	3 2	11 49	—	7 29	7 55
S	17	6 21	6 46	11 4	11 30	8 3	8 34	6 58	7 28	10 3	10 31	3 35	4 0	11 6	11 31	3 28	3 56	4 17	4 43	9 31	9 57	3 30	3 59	0 24	1 0	8 22	8 50
M	18	7 15	7 44	—	0 10	9 7	9 42	8 1	8 35	11 0	11 33	4 25	4 52	—	noon	4 26	4 59	5 11	5 41	10 26	10 58	4 31	5 4	1 38	2 18	9 21	9 54
T	19	8 17	8 51	0 45	1 18	10 18	10 55	9 11	9 48	—	0 9	5 21	5 53	0 33	1 9	5 35	6 15	6 13	6 49	11 34	—	5 37	6 11	2 55	3 30	10 32	11 12
W	20	9 28	10 5	1 51	2 21	11 30	—	10 23	10 57	0 46	1 25	6 27	7 3	1 47	2 25	6 55	7 31	7 26	8 3	0 12	0 49	6 44	7 17	4 1	4 36	11 51	—
Th	21	10 35	11 16	2 57	3 34	0 4	0 35	11 28	11 58	2 2	2 37	7 40	8 13	3 2	3 40	8 5	8 36	8 38	9 11	1 25	2 0	7 50	8 21	4 56	5 22	0 26	0 58
F	22	11 49	—	4 2	4 31	1 4	1 31	—	0 25	3 9	3 40	8 43	9 13	4 16	4 50	9 4	9 31	9 42	10 11	2 33	3 4	8 51	9 24	5 47	6 13	1 27	1 50
S	23	0 19	0 47	4 58	5 23	1 57	2 22	0 51	1 17	4 9	4 36	9 41	10 8	5 21	5 50	9 56	10 20	10 38	11 5	3 33	3 59	9 51	10 14	6 38	7 3	2 22	2 46
S	24	1 10	1 39	5 48	6 12	2 47	3 7	1 42	2 5	5 2	5 26	10 34	10 59	6 17	6 42	10 44	11 8	11 31	11 56	4 24	4 48	10 36	10 58	7 27	7 51	3 10	3 33
M	25	2 3	2 24	6 36	6 58	3 29	3 51	2 28	2 49	5 49	6 11	11 24	11 47	7 5	7 27	11 31	11 53	—	0 19	5 11	5 33	11 19	11 40	8 13	8 32	3 55	4 17
T	26	2 46	3 8	7 21	7 42	4 12	4 33	3 9	3 30	6 32	6 53	—	0 9	7 48	8 7	—	0 14	0 41	1 3	5 55	6 16	—	0 1	8 51	9 9	4 38	4 59
W	27	3 26	3 48	7 59	8 19	4 53	5 14	3 47	4 10	7 10	7 27	0 31	0 52	8 26	8 44	0 34	0 53	1 23	1 45	6 35	6 54	0 32	0 43	9 27	9 45	5 17	5 36
Th	28	4 4	4 27	8 36	8 55	5 33	5 51	4 26	4 48	7 44	8 1	1 10	1 31	9 2	9 19	1 13	1 31	2 2	2 20	7 13	7 30	1 12	1 32	10 3	10 21	5 55	6 14
F	29	4 44	5 6	9 13	9 32	6 14	6 33	5 08	5 28	8 18	8 35	1 53	2 13	9 39	9 56	1 53	2 12	2 42	3 2	7 53	8 12	1 52	2 12	10 40	11 0	6 32	6 50
S	30	5 24	5 46	9 51	10 11	6 56	7 14	5 48	6 8	8 54	9 12	2 35	2 55	10 16	10 34	2 34	2 54	3 24	3 44	8 34	8 54	2 34	2 54	11 23	11 43	7 11	7 29
M	31	6 10	6 31	10 33	10 54	7 41	7 59	6 33	6 53	9 34	9 52	3 20	3 40	10 57	11 16	3 20	3 40	4 10	4 30	9 20	9 40	3 20	3 40	—	0 13	7 47	8 7

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TIDAL CONSTANTS

For Various British, Irish, and European Ports.

By applying the Tidal Constant of the place, according to its sign (+ *add* — *sub.*), to the time of high water on the given day at the port of reference, you have the time of high water at the place sought.

Place.	Constant.	Port of Reference.
	H. M.	
Aberdeen	−1 17	Leith
Aberystwyth	−3 52	Liverpool
Alderney	+2 59	Brest
Antwerp	+5 13	Dover
Arbroath	−0 42	Leith
Arcachon	+0 50	Brest
Arklow	−2 25	Kingstown
Ayr	−0 18	Greenock
Banff	−1 49	Leith
Bantry harbour	−1 14	Queenstown
Barnstaple bridge	−0 26	Weston-s.-Mare
Bayonne	−0 2	Brest
Beachy head & Rye bay	+0 8	Dover
Beaumaris	−0 51	Liverpool
Belfast	+2 42	Londonderry
Berwick	−1 5	N. Shields
Blyth	−0 8	N. Shields
Bordeaux	+3 3	Brest
Boulogne	+0 13	Dover
Bridport	+0 24	Devonport
Bristol & King Road	+0 19	Weston-s.-Mare
Cadiz	−2 2	Brest
Caernarvon	−1 56	Liverpool
Calais	+0 37	Dover
Campbellton	−0 23	Greenock
Cardiff	+0 2	Weston-s.-Mare
Cardigan bar	−4 22	Liverpool
Carlingford bar	−0 10	Kingstown
Chatham	−0 47	London
Cherbourg	+4 2	Brest
Coleraine	−1 37	Londonderry
Coquet Road	−0 23	N. Shields
Cordouan Tower	−0 10	Brest
Cowes (West)	−0 27	Dover
Crinan	+4 41	Greenock
Cromarty	−2 21	Leith
Dartmouth	+0 33	Devonport
Deal & Downs	+0 8	Dover
Dieppe	+7 19	Brest
Donaghadee	+0 8	Kingstown
Donegal harbour	+0 17	Queenstown
Douglas & Ramsay	−0 11	Liverpool
Dublin bar	+0 2	Kingstown
Dundalk	−0 16	Kingstown
Dungeness	−0 27	Dover
Dunkerque	+0 56	Dover
Exmouth	+0 38	Devonport
Falmouth	−0 46	Devonport
Fecamp	+6 57	Brest
Ferrol	−0 47	Brest
Flamborough head	−1 59	Hull
Fleetwood	−0 12	Liverpool
Folkestone	−0 5	Dover
Fowey	−0 29	Devonport
Flushing	+1 42	Dover
Galway bay	−0 26	Queenstown
Gibraltar	−1 27	Brest
Glasgow (Port)	+0 10	Greenock
Gloucester	+2 51	Weston-s.-Mare
Granville	+0 26	Brest
Gravesend	−0 48	London
Grimsby (Great)	−0 53	Hull
Guernsey (St. Peter)	+2 50	Brest
Hartlepool	+0 5	N. Shields
Harwich	−1 52	London
Havre	+6 4	Brest
Helgoland	+0 21	Dover
Holyhead	−1 12	Liverpool
Holy Island harbour	−0 53	N. Shields
Honfleur	+5 42	Brest
Inverness	−1 59	Leith

Place.	Constant.	Port of Reference.
	H. M.	
Jersey (St. Helier)	+2 38	Brest
Kinsale	−0 18	Queenstown
Lerwick (Shetland)	−3 47	Leith
Limerick	+1 15	Queenstown
Lisbon Bar	−1 17	Brest
Littlehampton	+0 24	Dover
Llanelly bar	−0 38	Weston-s.-Mare
Lowestoft	−4 1	London
Lynn & Boston Deep	−0 29	Hull
Margate	−2 18	London
Maryport	+0 3	Liverpool
Milford Haven entr.	−0 58	Weston-s.-Mare
Montrose	−0 52	Leith
Morlaix	+1 6	Brest
Needles point	−1 26	Dover
Newcastle	+0 23	N. Shields
Newhaven	+0 39	Dover
Newport	+0 16	Weston-s.-Mare
Nieuport	+1 6	Dover
Nore	−1 28	London
Orfordness	−2 43	London
Oporto	−1 17	Brest
Ostende	+1 13	Dover
Padstow	−1 41	Weston-s.-Mare
Peel, Isle of Man	−0 15	Liverpool
Pembroke Dock	−0 42	Weston-s.-Mare
Penzance	−1 13	Devonport
Peterhead	−1 43	Leith
Piel harbour, Barrow	−0 18	Liverpool
Plymouth breakwater	−0 6	Devonport
Poole	−2 2	Dover
Port Carlisle	+0 47	Liverpool
Portland breakwater	+1 18	Devonport
Port Patrick	−0 58	Greenock
Portsmouth	+0 29	Dover
Ramsgate	−2 19	London
Rotterdam	+4 33	Dover
Santander	−0 17	Brest
Scarborough	+0 48	N. Shields
Selsea bill	+0 33	Dover
Sheerness	−1 21	London
Shoreham	+0 22	Dover
Sligo bay	+0 17	Queenstown
Southampton	−0 42	Dover
Spurn point	−1 3	Hull
St. Ives	−2 10	Weston-s.-Mare
St. Malo	+2 18	Brest
St. Mary (Scilly)	−1 16	Devonport
St. Nazaire	−0 7	Brest
Stornoway	+6 38	Greenock
Stromness (Orkneys)	−5 17	Leith
Sunderland	−0 1	N. Shields
Swansea bay	−0 53	Weston-s.-Mare
Tay bar	−0 11	Leith
Tees bar	+0 22	N. Shields
Tenby	−1 12	Weston-s.-Mare
Thurso	−5 49	Leith
Torbay	+0 17	Devonport
Tralee bay	−0 58	Queenstown
Ushant (Ouessant)	−0 15	Brest
Valentia harbour	−1 19	Queenstown
Waterford	+0 19	Queenstown
Westport	−0 4	Queenstown
Wexford	+2 20	Queenstown
Whitby	+0 22	N. Shields
Whitehaven	−0 9	Liverpool
Wick	−2 55	Leith
Wicklow	−0 41	Kingstown
Workington	−0 19	Liverpool
Yarmouth road	−4 48	London
Youghall	+0 13	Queenstown

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MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
404	England—South Coast—Start Point	Intended alteration in character of fog-signal.
405	„ West Coast—Skerries Light-house	Intended alteration in character of fog-signal.
406	„ „ Bristol Channel—Hartland Point	Fog-signal altered in character.
407	„ „ Bristol Channel—Breaksea Light-vessel	Alteration in position.
408	Scotland—East Coast—Firth of Forth—Herwit Rock	Now marked by Courtenay's signal buoy.
409	„ West Coast—Firth of Clyde—Sanda	Alteration of character of light.
410	„ Hebrides — Lewis Island — Beist of Holm Rock	New pillar beacon.
411	North Sea—Helgoland	Buoys altered in position.
412	Baltic—Sweden—Falsterbö Light-vessel	Fog-signal altered in character.
413	„ „ Stockholm Approach	New lights.
414	„ Gulf of Bothnia—Grisö—Oregrund Bay—Diursten	Alterations in light.
415	White Sea — Arkhangel Bay — Dvina River	New light-vessel.
416	France—West Coast—Roche Bonne	Light-vessel not in position, under repairs.
417	Spain—N.W. Coast—Cape Finisterre	Precautions necessary in passing.
418	Mediterranean—Tunis—Soussa	New harbour light.
419	„ Adriatic—Gulf of Trieste Cape Promontore—Porer Rock	Coloured sectors of light.
420	Africa—N.E. Coast—Cape Guardafui	Cautionary sailing directions.
421	India—West Coast—Diu Head	New light.
422	Bay of Bengal—Madras	Precaution on approaching harbour.
423	„ Chittagong River Approach	Discovery of a shoal.
424	China Sea—Buoys and Beacons	Uniform system of colouring.
425	„ Buoys and Beacons	Alterations in colour.
426	Australia—Port Phillip Entrance—Lightning Rocks	Rocks removed.
427	„ East Coast—Mourilyan Harbour	Discovery of rocks at entrance.
428	South America—Magellan Strait—Sandy Point Road	Buoys marking wreck of H.M.S. *Doterel*.
429	Gulf of Mexico — Campeche Bay — Frontera de Tabasco	New light.
430	United States—Rhode Island—Wickford Harbour—Old Gay Rock	New light and fog-signal.
431	„ New York—Long Island Sound—Lloyd Harbour	Light altered in colour.
432	„ „ Long Island Sound—Race Rock	Light changed in character.
433	„ Maine—Matinicus Rock	Light to be changed in character, &c., in 1883.
434	„ „ Cape Elizabeth	Light to be changed in character, &c., in 1883.
435	Canada—Nova Scotia—S.E. Coast—Mahone Bay—Westhaven Island	New light.

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NAUTICAL NOTICES.

All Bearings Magnetic, unless otherwise stated.

404.—ENGLAND.—*South Coast.—Start Point.—Intended Alteration in Character of Fog-Signal.*—It is intended at an early date, probably the end of December, 1882, to make the following alteration in the character of the fog-signal at Start point:—During thick or foggy weather, the signal will give *three blasts* in quick succession *every three minutes* in the following manner: the *first blast* a *high note*, the *second* a *low note*, and the *third* a *high note*. Further notice will be given.

405.—ENGLAND.—*West Coast.—Skerries Lighthouse.—Intended Alteration in Character of Fog-Signal.*—It is intended, early in February, 1883, to make the following alteration in the character of the fog-signal at Skerries lighthouse, north side of Holyhead bay:—During thick or foggy weather, the signal will give *three blasts* in quick succession *every three minutes* in the following manner: *two high notes* and *one low note*, each of *two seconds'* duration, at intervals of *two seconds*, followed by an interval of *one hundred and seventy seconds*. Further notice will be given.

406.—ENGLAND.—*West Coast.—Bristol Channel.—Hartland Point Lighthouse.—Alteration in Character of Fog-Signal.*—With reference to Notice 293, p. 709, the following alteration has been made:—During thick or foggy weather, the signal will give *two blasts* in quick succession *every two minutes* in the following manner: the *first blast* a high note, the *second* a low note.

407.—ENGLAND.—*Bristol Channel.—Breaksea Light-Vessel.—Alteration in Position.*—With reference to Notice 331, p. 787, the light-vessel has been moved 4 cables N.N.E. from its previous position, and now lies in 18 fathoms at low water spring tides, with the following mark, bearings, and distances:—Barry church, in line with Coldknap point, the parsonage just touching the west end of church, N.N.E. $\frac{1}{4}$ E.; Flatholm lighthouse, E. $\frac{1}{4}$ S., distant $6\frac{9}{10}$ths miles; One Fathom bank buoy, S.E. by E. $\frac{1}{4}$ E., distant 2 miles; West Culver buoy, S. by W. $\frac{1}{4}$ W., distant $3\frac{9}{10}$ths miles. *Variation*, $19\frac{1}{4}°$ *W.*

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408.—Scotland.—*East Coast.—Firth of Forth.—Herwit Rock, off Inchkeith.—Alteration of Buoy.*—The bell buoy formerly moored to mark the position of the Herwit rock, Inchkeith, has been withdrawn, and a Courtenay's pneumatic signal buoy now guards that danger. This pneumatic buoy, coloured red, is moored in the same position as that formerly occupied by the bell buoy, and the following are the marks and bearings from the buoy:—East Brow of Pentland hills, touching West Brow of Arthur's Seat, half-way up, S.W. ½ W.; East stables (red tiled house) of Pettycur, in line with East Brow of Inchkeith, N. by W.; Inchkeith lighthouse, N. by W. ½ W. The buoy is in 7 fathoms low water.

409.—Scotland.—*West Coast.—Sanda Lighthouse, Firth of Clyde, near the Mull of Kintyre.—Alteration of Character of Light.*—Referring to Notice 333, p. 787, respecting the change of the character and increase of the power of the Sanda light, the new light will be exhibited on and after the 11th November, 1882. The new light is intermittent white (instead of fixed red as formerly), and the periods of light will be eight seconds, and the periods of darkness sixteen seconds.

410.—Scotland.—*Hebrides.—Beacon on the Beist of Holm Rock, near Entrance of Stornoway Loch.*—A cast-iron pillar beacon, seventeen feet in height above the rock, and showing about seven feet above high water, has being erected upon the Beist of Holm rock, lying off Holm point, on the eastern side of the entrance to Stornoway loch, island of Lewis, Hebrides. The beacon is coloured red.

411.—North Sea.—*Helgoland Buoys.—Alteration in Position.*—The Sellebrunnen buoy (surmounted with staff and St. Andrew's cross) has been removed N. by W. 8 cables from its former position, and now lies in 12½ fathoms at low water spring tides, with the following mark and bearings, viz.:—Bull beacon, seen between the old and new lighthouses, rather nearer to the old, S. by E. ½ E.; Nathurn buoy (new position), South, distant 2 miles; N.W. beacon, S.S.E. ¾ E., distant 4 miles. The Nathurn buoy (surmounted by staff and diamond) has also been removed N.N.W. 8 cables from its former position, and now lies in 9 fathoms at low water spring tides, with the following mark and bearings, viz.:—

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N.W. and middle beacons in line, S.S.E. ¾ E.; Sellebrunnen buoy (new position) North, distant 2 miles; fog-signal house, S. by E. ¾ E., distant $1\frac{n}{10}$ths mile.

412.—BALTIC.—*Sweden.—Falsterbö Light-Vessel.—Alteration in Character of Fog-Signal.*—The following alteration has been made in the character of the fog-signal at Falsterbö reef light-vessel, southern approach to The Sound:—The signal is a siren, which, during thick or foggy weather, will give *two blasts* in quick succession *every thirty seconds.*

413.—BALTIC.—*Sweden.—Stockholm Approach.*—(1.) *Light near Waxholm.*—A leading light is now exhibited from the eastern of two beacons, that have been erected in place of two buoys previously moored eastward of Waxholm, Kodjupet (Ko Tief) channel, approach to Stockholm. It is a *fixed white* light. Position approximate, lat. 59° 24′ N., long. 18° 21′ E.

Note.—The eastern beacon is coloured red; the western beacon, black.

(2.) *Light on Vaxlet Rock.*—A leading light is now exhibited on Vaxlet (Wäxlet) rock, Furu sound, approach to Stockholm. It is an *intermittent white* and *red* light. Position approximate, lat. 59″ 35′ N., long. 18° 44½′ E.

(3.) *Light on Oranieholm.*—A leading light on the small islet Oranieholm, in the Träl Hafvet, at the entrance to Furu sound, approach to Stockholm. It is an *intermittent white* and *red* light. Position approximate, lat. 59° 27′ N., long. 18° 24′ E.

(4.) *Light on Kapelsk.*—A leading light on Kapelsk (Kapellskär), about five miles seaward of Furu sound, approach to Stockholm. It is an *intermittent white* and *red* light. Position approximate, lat. 59° 43′ 15″ N., long. 19° 5′ 0″ E. These lights will be shown annually from 1st August to 15th December.

414.—BALTIC.—*Gulf of Bothnia.—Gräsö Island.—Oregrund Bay.—Alterations in Diursten Light.*—In the northern channel, the light is visible through an arc of 30°, or between the bearings of S. 37° E. and S. 7° E.; showing a *flashing white* light with *two flashes* between S. 37 E. and S. 25 E. (over Länsman grund); a *fixed white* light between S. 25 E. and S. 16 E. (to Engelsk grund); and a *flashing red* light with *one flash* from S. 16 E. to S. 7 E. (to

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Gräsö isle). In the southern channel, the light is a *fixed white* light, as previously. *Variation*, 8¼° *W.*

415.—WHITE SEA.—*Arkhangel Bay.—Light-Vessel at North Dvina River Entrance.*—With reference to Notice 382, p. 871, on intended placing of a light-vessel, exhibiting two lights, in the approach to the new bar, North Dvina river entrance, Arkhangel bay, the light-vessel has been placed in position as indicated.

416.—FRANCE.—*West Coast.—Roche Bonne Light-Vessel.—Not in Position.*—Telegraphic information has been received from the French Government, through the Board of Trade, dated 24th October, 1882, that Plateau de Roche Bonne light-vessel has broken adrift, and has been taken into port for repairs.

417.—SPAIN.—*N.W. Coast.—Precautions necessary in Passing Cape Finisterre.*—The Committee of Lloyd's having drawn attention, through the Board of Trade, to the large number of vessels that during the last few years have been wrecked or otherwise lost in the neighbourhood of cape Finisterre, it is deemed desirable in the interests of seamen to re-publish the following information bearing on the navigation of that part of the coast of Spain. The sailing directions for the west coasts of France, Spain and Portugal, 3rd edition, 1881, published by the Admiralty, state at page 4 (as was also stated in the editions of 1867 and 1873):—

"The easterly current from the North Atlantic strikes the land near cape Ortegal in Spain, and then appears to divide into two branches; the northern (Rennell current) flowing eastward along the coast of Spain, then north along the west coast of France. * * * The southern branch turns gradually to the S.E. and southward along the coast of Portugal until having passed cape St. Vincent, when it runs eastward to the Strait of Gibraltar. It must not however be presumed that the current along the west coast of Spain and Portugal always sets to the southward, for during westerly winds it sets strong towards the land, and immediately after the continuance of southerly gales or strong breezes the current will probably be found setting to the northward. The mariner will perceive that caution is necessary in crossing the bay [of Biscay], and that due allowance should be made both for the outset and indraft, but especially the latter, when standing to the

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southward during thick weather for a position westward of cape Finisterre." It is also stated in the same sailing directions at page 224—"The coast between capes Ortegal and Finisterre is dangerous to approach at night, especially in the winter season, or in thick and foggy weather, which is frequent here, for not only does a powerful current at times set towards the land from the N.W., but the streams of flood and ebb often draw vessels out of their computed position." As some of the recorded wrecks in the neighbourhood of cape Finisterre may have arisen from the effects of the indraft, or set towards the land, as above described, the attention of mariners is again drawn to the necessity of caution and of a vigilant look-out when approaching the parallel of the cape. Mariners are also cautioned when approaching cape Finisterre, especially in vessels from ports of the United Kingdom, to lose no favourable opportunity of ascertaining the errors of the navigating compass:—one of the unsuspected causes of vessels being found, in thick weather, in dangerous proximity to the land, being doubtless due to the disregard of these necessary observations.

418.— MEDITERRANEAN. —*Tunis.—Bay of Soussa. — Soussa.— Harbour Light on Mole.*—Exhibited on the seaward part of the circular mole of Soussa harbour; it is a *fixed red* light, visible from a distance of 4 miles. Position approximate, lat. 35° 49′ 3″ N., long. 10° 39′ 0″ *E.*

419.— MEDITERRANEAN. — *Adriatic.— Gulf of Trieste. — Cape Promontore.—Porer Rock Low Light.—Coloured Sectors.*—With reference to Notice on proposed exhibition of two sectors of light, in addition to the fixed red light shown from a window of the building below the lighthouse on Porer rock, south-westward of cape Promontore, the sectors are now exhibited. The red light is shown over Sunk rock (Secca Pericolosa) through an arc of 11½°; the sectors are—fixed *white* from the eastern limit of the red light towards Fenera islet, and fixed *green* westward of the western limit of the red light—so that, vessels within the sector of white light will be eastward of Sunk rock, and within the sector of green light will be westward of Sunk rock.

420.—AFRICA.—*N.E. Coast.—Precautions necessary in rounding Cape Guardafui (Ras Asir) from the Southward.*—The Committee

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of Lloyd's having drawn attention, through the Board of Trade, to the large number of wrecks which of late years have taken place in the neighbourhood of cape Guardafui, it has been considered desirable to re-publish, for the guidance of mariners, the following information bearing on the navigation of that locality. It is to be observed that the wrecks in the neighbourhood of cape Guardafui have occurred chiefly during the period of the S.W. monsoon (April to September). In this season the weather, when approaching the African coast, is stormy and accompanied by a heavy sea; the currents are strong, and the land is generally obscured by a thick haze. Vessels bound from the eastward through the gulf of Aden, during the S.W. monsoon, approach cape Guardafui from the southward: as the route usually adopted lies between that cape and the island of Sokotra. In inculcating due caution for vessels using this route, the directions, published by the Admiralty, in the "Gulf of Aden pilot," second edition, 1882, state at page 10 (as is also stated in the African pilot, part 3, 3rd edition, 1878):—

"As many large and valuable vessels have from time to time been wrecked with loss of life on the coast southward of cape Guardafui (Ras Asír), when bound round this headland from the south-eastward, seamen should use the utmost caution not only in making the land, but also in verifying the vessel's position by soundings, more especially at night or during the S.W. monsoon, when the weather is hazy. As soundings extend from 10 to 12 miles from the coast, the deep-sea lead should frequently be used, and the vessel's course altered to N. by E. or N. by E. ½ E., or if necessary more to the eastward, immediately soundings are struck, or the land sighted in dark or hazy weather. By steering to the northward as above, and by not standing into less than 35 fathoms water, the vessel's safety will be ensured, and as the water rapidly deepens northward of the parallel of the cape, the 100 fathoms line of soundings being only 2½ miles from it, there will be no difficulty as to the time when the course should be again altered to W.N.W. During day a gradual change will probably be seen in the colour of the water from blue to dark green. Attention should also be paid to the alteration in the direction of the swell caused by the promontory of Ras Hafún." [Ras Hafún is about 80 miles south of cape Guardafui.]

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At page 13, it is stated :—"Caution is requisite in making the land north of Ras Hafún in the night. The water gets smoother, and the swell alters its direction to the eastward of south, when the meridian of that cape is passed." And at page 42 (as also in the 1st edition, 1863) :—"Care is necessary in making the cape (Guardafui) for the gulf of Aden, during the S.W. monsoon; the current setting up the coast strong to the northward and close round the cape to the westward; but at a short distance (off shore) the current continues its course to the northward and eastward, whereby a vessel unless close in with the land, would be set out of her course and probably lose her passage;" or, in other words, be set eastward towards Sokotra. The valuable guidance afforded in the directions for approaching cape Guardafui from the southward, above quoted, and the precautions to be observed—derived, as those directions are, from experience extending over many years—cannot be too earnestly recommended to seamen.

421.—India.—*West Coast.—Light on Diu Head.*—Exhibited from a lighthouse erected near the temple on Diu head (Mandwa or Modhna point), south coast of Katiawar. It is a *flashing white* light, flashing at intervals of *ten seconds*, elevated 110 feet above high water, and visible from a distance of 14 miles. The lighthouse, 32 feet high, is constructed of masonry, and coloured white. Position, lat. 20° 41′ 20″ N., long. 70° 50′ 45″ *E.*

422.—Bay of Bengal.—*Madras.—Precaution on Approaching Madras Harbour.*—With reference to Notice 351, p. 792, "on precaution to be observed by steam-vessels arriving at Madras," it has been further notified that masters of all other vessels arriving off the harbour during the night should not approach nearer, nor anchor in less water than 10 fathoms, until day-break —as, since the damage to the harbour walls, lights cannot be exhibited from either the north or south harbour groyne, the eastern portion of the walls being very nearly submerged, and resembling a reef of rocks.

423.—*Bay of Bengal.—Chittagong River Approach.—Shoal Eastward of D'Apres Shoal.*—Lying about 15 miles E. ¼ S. from the southern end of D'Apres shoal, approach to Chittagong river, this shoal is stated to have 15 feet over it, the sea breaking heavily

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around. Position approximate, lat. 21° 55′ 30″ N., long. 91° 22′ 30″ E. *Variation*, 2¾° *E.*

424.—China Sea.—*Uniform System of Colouring Buoys and Beacons in Chinese Waters.*—The side of the channel is to be considered starboard, or port, with reference to the entrance to any port from seaward. 1. Buoys coloured *red* mark the starboard side of the channel, and must be left on the starboard hand by vessels entering. 2. Buoys coloured *black* mark the port side of the channel, and must be left on the port hand by vessels entering. 3. Buoys painted in *red and black horizontal bands* mark the fairway, and should be passed close-to. 4. Buoys painted in *red and black vertical stripes* mark the ends of spits, and the outer and inner extremes of banks, shoals, or extensive reefs, where there is a navigable channel on either side. 5. Buoys painted *red and black chequered* mark rocks in the open sea, also obstructions of small extent having channels on either side of them. When marking the latter, they will be placed seaward of the danger. 6. When two *chequered* buoys—*red and white* and *black and white*—mark an obstruction, the *red and white* buoy marks the starboard side of the channel, and must be left on the starboard hand by vessels entering; and the *black and white* buoy marks the port side of the channel, and must be left on the port hand by vessels entering. 7. Wrecks will in all cases be marked by *green* buoys, with the word *wreck* painted on them in *white* letters; when a wreck lies in the open sea or in a position where there is a navigable channel on either side of it, the buoy will carry no other distinguishing mark, and will in every such case be placed seaward of the wreck. The numbers on wreck buoys will be painted in *white*, and placed above the word *wreck*. Wreck buoys marked with an *even* number must be left on the starboard hand by vessel entering. Wreck buoys marked with an *odd* number must be left on the port hand by vessels entering.

Note.—All other distinguishing marks to buoys will be in addition to the foregoing, and where such are employed, a particular description of them will in each case be given in the published List of Chinese Lighthouses, &c. Each buoy will have an iron plate on its outside, above the water-line, with the name

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of its district and station (as given in the published List) stamped thereon in English and Chinese, to insure its identification if found adrift.

1. Beacons coloured *red* mark the starboard side of the channel, and must be left on the starboard hand by vessels entering. 2. Beacons coloured *black* mark the port side of the channel, and must be left on the port hand by vessels entering. 3. Beacons painted in *red and black vertical stripes* mark spits, and the outer and inner extremities of banks, shoals, or extensive reefs, where there is a navigable channel on either side. 4. Beacons painted *red and black chequered* mark rocks in the open sea, also rocks of small extent having channels on either side of them. 5. When two *chequered* beacons, *red and white* and *black and white*, mark a rock or reef, the *red and white* beacon marks the starboard side o the channel, and must be left on the starboard hand by vessels entering; and the *black and white* beacon marks the port side of the channel, and must be left on the port hand by vessels entering.

Note.—The above rules for painting beacons apply in each case to the body of the structure. When a beacon painted a single colour, either black or red, is surmounted by a distinguishing mark, such mark may be painted the same colour as the body of the beacon, or with that colour and white combined, or white alone. When the body of a beacon is painted in two colours, the same colours only may be used for the mark surmounting it. Whenever a distinguishing mark is used, a particular description of it will be given in the published List of Chinese Lighthouses, &c. Beacons on shore, to enable bearings to be taken, or to give lines of direction for crossing bars or entering rivers, harbours, &c., are to be painted so as to make them as conspicuous as possible. Red, black, and white are the only colours to be used, and a particular description of such marks will be given in the published List.

425.—China Sea.—*Buoys and Beacons.—Alterations in Colour.* —With reference to Notice and in accordance therewith, on 15th September, 1882, or as soon after as practicable, the following alterations would be made:—

(1.) *Canton River.*—1. Tai-shek Barrier Eastern Beacon has

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the lower part (from upper end of braces downward) painted red; lower half of pole, white; and upper half of pole with circular frame surmounting, red. 2. Tai-shek Barrier Western Beacon is painted the same as the Eastern beacon. 3. Tai-shek Barrier Middle Beacon has the lower part (from upper end of braces downward) painted red; the upper part remains white. 4. Dutch Folly South Beacon is painted black. 5. Dutch Folly South Beacon is painted black.

(2.) *Port of Swatow.*— 1. Wyoming Rock Buoy carries an inverted frustum cage, and is painted black. 2. Madras Rock Buoy is painted black. 3. Wreck Buoy is painted green, with the word *wreck* and the numeral "4" on it, in white. 4. Gochang Rock Beacon, with pole and basket, is painted black.

(3.) *Amoy Harbour.*—1. Coker Rock large Buoy is black and white chequered. 2. Coker Rock small Buoy is red and white chequered. 3. Harbour Rock Buoy is red and black chequered. 4. Kellett Spit Buoy is painted red and black in vertical stripes. 5. Alibi Rock, Kangsimtah, and Chiotah Beacons are painted black.

(4.) *Min River.*—1. Oriental Rock Beacon is painted red, with name on cage in white letters. 2. Half-tide Rock Beacon (granite) is painted black.

(5.) *Kintang Channel, and Yung River Entrance.*—1. Alligator Beacon is coloured red. 2. Blonde Rock Beacon, with cage, is painted black. 3. Nemesis Rock Beacon (a single spar) is painted red, and surmounted with an inverted frustum cage, painted white. 4. Sesostris Rock Buoy—the cage and tripod are painted black. 5. Tigers Tail Rock Beacon is painted black with white cage.

(6.) *Wusung River Entrance.*—Lismore Wreck Buoy has the numeral "I." painted over the word *wreck*.

(7.) *Pei-ho River Entrance.*—Imer Buoy is painted red.

(8.) *Liau River.*—1. East Spit Beacon (spar surmounted with two balls, with the numeral "V." on the lower one) is painted red. 2. Nodding Tommy Beacon (spar surmounted with a diamond-shaped box with the numeral "IV." on it) is painted red, with the exception of an horizontal stripe round the middle of the box, which is painted white. 3. Middle Bank Beacon (a spar surmounted with diamond, having the numeral "III." on it) now

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carries a spherical cage, and is painted red. 4. Flagstaff Beacon (a spar surmounted with two diamond-shaped boxes, with the numeral "II." on the lower one) is painted red from the ground to the bottom of the lower box, white thence to the bottom of the upper box, the remainder red. 5. Fish House Beacon (a spar surmounted by a diamond-shaped box with the numeral "I." on it) is painted black.

426.—AUSTRALIA.—*South Coast.—Port Phillip Entrance.—Removal of Lightning Rocks.*—These rocks, in the entrance to port Phillip, have been removed, and there is now a least depth of 32 feet over and around their positions; also, the depths—over the patches of 25-28 feet, 28 and 29 feet, which existed about 3½ cables N.W. of the position of Lightning rocks, and over that of 29 feet about 2 cables S.E. of that position—have been increased to 30 feet.

427. — AUSTRALIA. — *East Coast. — Queensland. — Rocks in Mourilyan Harbour Entrance.*—The commander of the Colonial Government schooner *Pearl* reports having found a rock with 4½ feet over it at low water spring tides, lying in Mourilyan harbour entrance, with Goodman rock bearing N. ½ W., distant 60 yards. Also, other rocks awash at low water, lying with Goodman rock bearing N.W., distant 30 yards.

Note.—The available channel, which is between these dangers, is only 40 yards in width, and must be used with the greatest caution. *Variation*, 6½° *E.*

428.—SOUTH AMERICA.—*Magellan Strait.—Broad Reach.—Sandy Point Road.—Buoys Marking Wreck.*—Two buoys have been placed to mark the position of the wreck of H.M.S. *Doterel.* A buoy (of a temporary character), triangular in shape, with staff and ball (painted green, 10 feet above the sea) has been placed over the wreck—with Block-house bearing N.W. ¾ N., distant 7½ cables. An iron buoy, square in shape and coloured red, marks the inner side of the wreck. The wreck—the position of which may be known when over it by the accumulation of kelp—with a least depth of 6 fathoms over the hull, lies with the following mark and bearings:—The principal lighthouse just open westward of the small lighthouse, N.W. ¾ N.; Cemetery cross, W. ½ N.; Sandy

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point, N. by E. Mariners are cautioned not to anchor near the wreck. *Variation*, 21½° *E.*

429.—*Gulf of Mexico.—Bay of Campeche.—Tabasco River Entrance.—Light at Frontera de Tabasco.*—Exhibited from a lighthouse erected at the harbour of Frontera de Tabasco. It is a *fixed white* light, varied by a *flash every forty seconds*, elevated 77 feet above the sea, and visible—the fixed light from a distance of 11 miles, and the flash from a distance of 13 miles. The lighthouse, constructed of iron, is painted a greenish white. Position approximate on Admiralty chart, lat. 18° 38′ N., long. 92° 43′ W.

430.—UNITED STATES.—*Rhode Island.—Narragansett Bay.—Wickford Harbour.—Light and Fog-Signal on Old Gay Rock.*—Exhibited from a lighthouse recently erected on Old Gay rock, south side of Wickford harbour entrance, Narragansett bay. It is a *fixed white* light, elevated 47 feet above high water, and visible from a distance of 12 miles. The lighthouse, 42 feet high, consists of a frame building, with a square tower attached, standing on a cast-iron pier 50 feet in diameter. The tower and building are painted white, the pier red, and the lantern black. Position, lat. 41° 34′ 20″ N., long. 71° 26′ 14″ W. Also a fog-signal would be established at Old Gay rock lighthouse. The signal is a bell, struck by machinery, which, during thick and foggy weather, will give *one blow* at intervals of *twenty seconds*.

431.—UNITED STATES.—*New York.—Long Island Sound.—Huntington Bay.—Lloyd Harbour Light.—Alteration in Colour.*—The light is now *fixed red*, instead of fixed white as previously.

432.—UNITED STATES.—*New York.—Race Rock Light.—Change of Character.*—On and after December 1, 1882, the Race rock light at the eastern end of Long island sound, which now flashes alternately red and white at intervals of 30 seconds, will flash at intervals of 10 *seconds*, but without other change.

433.—UNITED STATES.—*Maine.—Matinicus Rock Lights.—Change of Characteristics.*—On and after July 1, 1883, the third order light now displayed from the southern tower on Matinicus rock will be *fixed red*, instead of fixed white, as now shown. The light now shown in the northern tower will be extinguished from and after the same date.

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434.—UNITED STATES.—*Maine.*—*Cape Elizabeth Lights.*—*Change of Characteristics.*—On July 1, 1883, the first order fixed white light now displayed from the eastern tower on Cape Elizabeth will be changed to a *second order white* light, *flashing* at intervals of 30 seconds. The light on the western tower will be *discontinued* on the same date.

435.—CANADA.—*Nova Scotia.*—*S.E. Coast.*—*Mahone Bay.*—*Light on Westhaver Island.*—Exhibited from a lighthouse erected on Westhaver island, Mahone harbour entrance, west side of Mahone bay. It is a *fixed white* light, elevated 59 feet above high water, and visible from a distance of 13 miles. The lighthouse, 38 feet high, consists of a square tower constructed of wood and painted white, with keeper's dwelling attached; it is situated on the summit of the small island. Position, lat. 44° 26′ 10″ N., long. 64° 20′ 5″ W.

CHARTS, &c., PUBLISHED BY THE HYDROGRAPHIC DEPARTMENT, ADMIRALTY, IN SEPTEMBER AND OCTOBER, 1882.

No.		*s.*	*d.*
2661	China sea, northern portion, 2 sheets, each ...	2	6
2576	Sulu sea:—Sulu archipelago and the north-east coast of Borneo	2	6
597	Africa, east coast.—Delagoa bay to cape Guardafui, including Mozambique channel and Madagascar island, with the off-lying islands and reefs ...	3	0
437	Australia, Torres strait:—Albany pass to Booby island, including Endeavour strait, Normanby sound, Prince of Wales and Dayman channels ...	2	6
847	Australia, east coast:—Percy isles to Whitsunday island (plans, Approaches to Pioneer river. Beverley islands anchorage)	2	6

CHARTS THAT HAVE RECEIVED IMPORTANT CORRECTIONS.

No.	
721	South Indian ocean:—Seychelle group.
2045	England, south coast:—Owers to Christchurch.

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No.

2154 England, south coast :—Newhaven.
1756 Spain, west coast :—Cape Finisterre to Vigo bay.
2062 China :—Tong-King gulf.
2366 Baltic sea :—Arkona to Stettin bay.
1258 China :—Approaches to Séoul.
2866 United States :—Winyah bay and Georgetown harbour.
967 Eastern archipelago :—Palawan island.
948 Eastern archipelago :—Balabac strait, and channels between Borneo and Paláwan.
1755 Spain, west coast :—Ferrol harbour to cape Finisterre.
1769 China :—Chinchu harbour.
744 India, west coast :—Cape Ramas to Alvagudda.
1833 England, east coast :—Medway river, sheet 1.
2112 Borneo :—Ambong bay to Sampanmangy point.
764 South Pacific ocean :—New Hanover, New Ireland, and New Britain.
2691 South Pacific ocean :—Fiji islands.
1249 Fiji islands :—Ovalau and Moturiki islands.
2776*a* Africa, west coast :—Kwara river.
2185 New Zealand :—Nelson anchorage.
941*b* Eastern archipelago, western portion.
1033 Australia, west coast :—Champion bay to cape Naturaliste.
1277 South America, west coast :—Grande point to San Francisco point.
2160 Eastern archipelago :—Carimata strait.
2660*b* China sea, southern portion.
2600 West Indies :—San Domingo to Dominica
185 Baltic sea : — Port Swinemunde and approaches to Stettin.
279 Newfoundland :—Cape Rouge and Croc harbours.
1848 Spain, south coast :—Port of Malaga.
627 Africa, west coast :—St. Paul de Loando to Great Fish bay.
1929 Central America, west coast :—Bahia Honda.
1493 Central America, east coast :—Port Chagre, Colon bay, and
771 Oosima group :—Hancock bay.

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HYDROGRAPHIC NOTICES RECENTLY PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, 1882.

No. 25.—WEST INDIA PILOT, vol. 2. Relating to the anchorage off Grand Turk island.

No. 26.—CHINA SEA DIRECTORY, vol. 4. Relating to Liu-Kiu islands, and to Kiusiu.

No. 27.—CHINA SEA DIRECTORY, vol. 4. Relating to the entrance of Salee river, approach to Séoul, Prince Imperial archipelago, and Prince Jerome gulf.

No. 28.—PACIFIC OCEAN. Relating to the Solomon islands.

No. 29.—EASTERN ARCHIPELAGO. Relating to the north-east coast of Borneo, from Mallawallé island to Sandakan harbour.

No. 30.—CHINA SEA DIRECTORY, vol 2. Relating to Tong-King gulf, Hainan island and strait, and south coast of China.

BOOK.

	s.	d.
Tide Tables for 1883	1	6

OUR OFFICIAL LOG.

OFFICIAL INQUIRIES AT HOME, 1882.

1522. *Dunara Castle*, S.S.; built at Port Glasgow, 1875; owned by Mr. W. Lang and others; tonnage, 245; Glasgow to Western Hebrides; general cargo and passengers; stranded off Ardmore, Islay, September 1, 1882. Inquiry held at Glasgow, October 10, 1882, before White and Baird, Justices; Curling and Hyde, N.A. Master to blame for not setting safe and proper courses, and for neglect of the lead. Certificate suspended for three months.

1525. *Ethiopia*, S.S.; built at Liverpool, 1873; owned by the African Steamship Company; tonnage, 1,125; Liverpool to Coast of Africa; general cargo; lost off Indian Point, Loango, July 28, 1882. Inquiry held at Liverpool, October 14, 1882, before Raffles, Judge; Parfitt and Murdoch, N.A. Casualty caused by

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master wrongly estimating his distance in entering the port of Loando. Acquitted of wrongful act or default.

1527. *Lilydale*, s.s.; built at South Shields, 1873; owned by Mr. B. R. Huntley and others; tonnage, 400; Hartlepool to Flensborg; coals; damaged by striking a rock off Langeland, Great Belt, June 14, 1882. Inquiry held at Middlesborough, October 16, 1882, before Coleman, Judge; Beasley and Anderson, N.A. Mate in default for altering course to westward before clearing Guldstav Point. Certificate suspended for three months.

1528. *St. Maur*, barque; built at Liverpool, 1858; owned by Ship St. Maur Company, Limited; tonnage, 1,486; Calcutta to Liverpool; jute, linseed, &c.; supposed to have foundered at sea. Inquiry held at Liverpool, October 16, 1882, before Raffles, Stip. Mag.; Burney and Pickard, N.A. Vessel left Calcutta in good order and not overladen. No evidence as to cause of loss.

1529. *Achilles*, s.s.; built at Barrow, 1874; owned by Mr. R. Little and others; tonnage, 307; Riga to Waterford; railway sleepers; stranded at St. Patrick's Bridge, near Saltees Rocks, County Wexford, September 22, 1882. Inquiry held at Glasgow, October 16, 1882, before Cowan and Sharp, Justices; Parish and Ward, N.A. Master committed grave mistakes, but they did not amount to wrongful act or default.

1530. *Crosby*, s.s.; built at North Shields, 1870; owned by Mr. W. J. Jobling and others; tonnage, 1,161; Newport (Mon.) to Ancona; coals; lost near Peniche Point, Coast of Portugal, August 31, 1882. Inquiry held at Westminster, October 12, 1882, before Rothery, Wreck Commissioner; Ronaldson and Kennedy, N.A. Master in default for negligent navigation in steering too easterly a course considering the strong west wind blowing at the time. Certificate suspended for six months: recommended for one as mate. Chief mate also to blame.

1531. *Hardware*, brig, and *Wans Fell*, s.s.; the former built at Liverpool, 1821; owned by Mr. W. Burnyeat and others; tonnage, 148; Newport (Mon.) to Queenstown; coals. The latter built at Paisley, 1882; owned by Wans Fell Steamship Company, Limited; tonnage, 164; London to Newport; sleepers; in collision in the Bristol Channel, September 13, 1882, when the *Hardware*

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foundered. Inquiry held at Westminster, October 13, 1882, before Rothery, Wreck Commissioner; Methven and Ronaldson, N.A. Collision caused by look-out on board *Wans Fell* not seeing the brig's riding light until too close to avert a collision.

1532. *Royal Oak*, ship; built at Carleton, N.B., 1863; owned by Mr. W. Robert and others; tonnage, 1,243; Friedrichstadt to Sydney, N.S.W.; flooring boards; lost on North Ronaldshay, August 15, 1882. Inquiry held at Liverpool, October 18, 1882, before Raffles, Judge; Harland and Hyde, N.A. Master in default for not using the lead. Certificate suspended for three months.

1533. *Willing Mind*, tug steamer; built at South Shields, 1855; owned by Messrs. Henry Booker and others; tonnage, 81; on a towing job; foundered in consequence of an explosion taking place, September 14, 1882, when loss of life ensued. Inquiry held at Hull, October 19, 1882, before Twiss, Judge; Curling and French, N.A.; Ravenhill, E.A. Explosion caused by neglect of the engines, and want of water in boilers. Blame attached to master, and those in charge of engines.

1534. *Winston*, s.s., and *Warwick Castle*, s.s.; the former built at West Hartlepool, 1876; owned by Mr. C. M. Webster and others; tonnage, 911; proceeding out of Dartmouth harbour. The latter built at Glasgow, 1877; owned by the Mail Packet Company; tonnage, 1,892; moored in Dartmouth harbour. In collision, September 27, 1882, when loss of life ensued. Inquiry held at Westminster, October 18, 1882, before Rothery, Wreck Commissioner; Powell, Ronaldson and Vaux, N.A. Collision caused by the negligent navigation of the *Winston* by the pilot in charge. Master also in default for leaving the bridge when approaching a dangerous channel.

1536. *Eurynome*, ship; built at Port Glasgow, 1882; owned by Messrs. Heap & Co.; tonnage, 1,346; Geelong to Havre; wheat; supposed to have foundered at sea. Inquiry held at Liverpool, October 21, 1882, before Raffles, Judge; Forster and Grant, N.A. Vessel in good and seaworthy condition when she sailed, but slightly overladen. No evidence as to cause of loss.

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1537. *Adriatic*, barque; built at Miramichi, 1856; Leith to Quebec; coals; lost in the Straits of Belle Isle, September 1, 1882. Inquiry held at Leith, October 21, 1882, before McIntosh and Garland, Justices; Comyn and Davies, N.A. Both master and mate in default for negligent navigation in narrow waters. Certificates suspended for six and three months respectively.

1540. *Govino*, s.s.; built at Sunderland, 1882; owned by T. Pinkney and Sons; tonnage, 1,454; Sunderland to London; sleepers and coals; stranded on the coast of Norfolk, October 10, 1882. Inquiry held at Westminster, October 21, 1882, before Rothery, Wreck Commissioner; Methven and Vaux, N.A. Master in default for endeavouring to pass between the shoals and mainland in thick weather. Certificate not dealt with.

1545. *Belted Will*, barque; built at Sunderland, 1867; owned by Mr. G. Watson and others; tonnage, 345; Barletta to Tripoli; ballast; stranded near Brindisi, September 4, 1882. Inquiry held at Sunderland, October 24, 1882, before Booth and Simey, Judges; Parish and Murdoch, N.A. Both master and mate much to blame. Severely reprimanded.

1550. *Sarah*, schooner; built at Kingsbridge, 1858; owned by Mr. J. Sharp; tonnage, 148; Falmouth to Glasgow; oil; stranded on Briguird Spit, Firth of Clyde, October 10, 1882. Inquiry held at Glasgow, October 30, 1882, before Hamilton and Robinson, Justices; Parfitt and Wilson, N.A. Master guilty of error of judgment, in mistaking a light in a dwelling-house for Cumbrae Light. Cautioned to be more careful.

1552. *Hesleden*, s.s.; built at West Hartlepool, 1876; owned by Mr. R. Ropner and others; tonnage, 975; Cardiff to Port Said; coals; damaged by fire, September 29, 1882. Inquiry held at Cardiff, October 28, 1882, before Rothery, Wreck Commissioner; Castle and Anderson, N.A. Fire caused by an iron bulkhead near boilers becoming so heated as to ignite a wooden bulkhead in the main-hold. No blame attributable to master or officers.

1553. *Naomi*, brig; built at Aberdovey, 1865; owned by Captain L. Williams (the master) and others; tonnage, 203; Newport (Mon.) to Enseñada; coals; destroyed by fire at sea, August 28, 1882. Inquiry held at Newport, October 27, 1882, before Rothery,

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Wreck Commissioner; Castle and Kennedy, N.A. Fire probably caused by a paraffin lamp having been accidentally upset in the forehold. Master free from blame.

1554. *Winston*, s.s.; built at West Hartlepool, 1876; owned by Mr. C. M. Webster and others; tonnage, 911; Newcastle to Boston; stranded on North Carr Rock, Fife Ness, October 10, 1882. Inquiry held at Dundee, October 31, 1882, before McGavin and Edward, Justices; Ward and Davies, N.A. Master to blame for neglecting to verify vessel's position by cross bearings. Admonished to be more careful in future.

1558. *St. George*, brig; built at Harrington, Cumberland, 1814, tonnage, 292; Maryport to Doboy; ballast; standed near Ballywalter, Coast of Ireland, October 19, 1882. Inquiry held at Maryport, November 7, 1882, before Senhouse and Addison, Justices; Murdoch and Hyde, N.A. Casualty caused by ballast being improperly trimmed, causing the vessel to be unmanageable.

1560. *Craiglands*, s.s.; built at West Hartlepool, 1879; owned by Mr. R. Hardy and others; tonnage, 709; Simo to West Hartlepool; deals; lost near Bjoroklubb, Sweden, September 29, 1882. Inquiry held at Middlesborough, November 4, 1882, before Coleman, Judge; Curling and Harland, N.A. Master exonerated from blame.

1561. *Vulcan*, s.s.; built at Middlesborough, 1874; owned by Mr. E. Harris and others; tonnage, 235; Middlesborough to Grangemouth; pig iron; lost on Vows Rocks, Firth of Forth, October 15, 1882, when loss of life ensued. Inquiry held at Middlesborough, November 1, 1882, before Coleman, Judge; Knox and Moresby, N.A. Loss caused by master steering too northerly a course and omitting to use the lead.

1562. *Preston*, s.s.; built at West Hartlepool, 1882; owned by Mr. R. Ropner and others; tonnage, 1,641; New York to the Tyne; general cargo; stranded on Goswick Sands, Northumberland, October 13, 1882. Inquiry held at Middlesborough, November 8, 1882, before Coleman, Judge; French and Kennedy, N.A. Casualty caused by negligent navigation on master's part. Certificate suspended for three months.

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Official Inquiries Abroad, 1882.

1523. *Zephyr*, brigantine; lost on Craggy Island Reef, Bass's Straits, July 14, 1882. Inquiry held at Hobart, August 3, 1882. Loss due to error of judgment on part of master.

1524. *Stag*, barque; lost on Vansittart Shoal, Furneaux Islands, August 1, 1882. Inquiry held at Launceston, August 15, 1882. Master in default. Certificate suspended for three months. Mate censured.

1526. *Black Prince*, ship; lost on a coral reef off Arends Island, August 5, 1882. Naval Court held at Sourabaya, August 17, 1882. Master guilty of error of judgment. Reprimanded.

1535. *Elizabeth Curle*, schooner; lost on Cuvier's Island, July 29, 1882. Inquiry held at Auckland, August 8, 1882. Loss due to master unnecessarily navigating too close to a lee shore.

1538. *Woonona*, s.s, and *Saxonia*, s.s.; in collision in Sydney Cove, August 22, 1882. Inquiry held at Sydney, August 29, 1882. Collision caused by master of *Saxonia* endeavouring to cross *Woonona's* bows. Cautioned.

1539. *Dunselaw*, ship; abandoned at sea, August 11, 1882. Inquiry held at Port Adelaide, September 4, 1882. Abandonment justifiable.

1541. *Orielton*, brigantine; lost at Urnahu, Brazil, July 31, 1882. Naval Court held at Ceará, Brazil, August 28, 1882. Loss due to large error in chronometer, and continued thick weather.

1542. *Norwood*, barque; lost on West Reef, Preparis Island, July 5, 1882. Inquiry held at Rangoon, July 25, 1882. Casualty due to an error of judgment.

1543. *Sea Queen*, barque; damaged by fire, July 12, 1882. Inquiry held at Calcutta, September 4, 1882. Fire caused by some of the hands taking a naked light into the spirit-store, their object being to pilfer rum.

1544. *Empress*, barque, and *Fu-Yew*, s.s.; in collision near Kintoan lightship, August 2, 1882, when the barque foundered. Naval Court held at Shanghai, August 11, 1882. Master of *Empress* guilty of grave error of judgment. Reprimanded.

1546. *Red Star*, s.s.; lost in Sulina Roads, October 13, 1882.

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Naval Court held at Sulina, October 20, 1882. Master free from blame.

1547. *Sea Bird*, barque; off Ossabaw Island, October 4, 1882. Naval Court held at Savannah, Georgia, October 14, 1882. Master wanting in precaution whilst navigating a dangerous coast. Censured.

1548. *Mallard*, s.s.; lost on Chinchorro Bank, Coast of Yucatan, September 15, 1882. Inquiry held at Belize, September 27, 1882. Casualty due to master mistaking his position, and neglecting to keep a look-out.

1549. *Helen White*, barque; supposed to have foundered at sea. Inquiry held by Marine Board of South Australia, September 12, 1882. No evidence as to cause of loss.

1551. *Jessie Burrill*, ship; destroyed by fire, August 4, 1882. Naval Court held at Shanghai, August 19, 1882. Fire caused by leaving lighted lamps on board when crew left. Both master and mate to blame. Certificate suspended for six and four months respectively.

1555. *Surprise*, schooner, and *City of Dallas*, s.s.; in collision off the Harbour of Belize, October 4, 1882, when the schooner foundered. Inquiry held at Belize, October 10, 1882. Master of schooner in default.

1556. *Blenheim*, s.s.; lost on S. James Point, Eleuthera, August 11, 1882. Inquiry held at Nassau, New Providence. Lost due to gross carelessness on the part of chief mate.

1557. *C. A. Belyea*, barque; lost on Uranie Rock, Falkland Islands, September 17, 1882. Inquiry held at Stanley, September 21, 1882. Master exonerated from blame.

1559. *Airy*, s.s., and *Mobile*, s.s.; in collision off Malta, October 1, 1882. Inquiry held at Valetta, October 4, 1882. Collision caused by chief mate of *Mobile* keeping a negligent look-out, and starboarding his helm. Certificate suspended for three months. Master exonerated.

1563. *Europe*, s.s.; lost on a rock, not on Admiralty chart, near Wou Fou Island, September 5, 1882. Naval Court held at Pagoda Island, September 12, 1882. No blame attaches to master.

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GENERAL.

PORT OF LONDON.—(LIMITS OF PORT).—We, the undersigned, Lords Commissioners of Her Majesty's Treasury of the United Kingdom of Great Britain and Ireland, do hereby, under the authority of "The Customs Consolidation Act, 1876," appoint London to continue and be a port in that part of the United Kingdom called England, and do hereby declare that the limits of the said port of London shall commence at high watermark in the River Thames at Teddington Lock, in the county of Surrey, and extend down both sides of the River Thames to an imaginary straight line drawn from the north-eastern extremity of the Isle of Grain, in the county of Kent, to the pilot mark at the entrance of Havengore Creek, in the county of Essex, and shall include the islands in Havengore Creek, called Potton and Rushly Islands, and so much of the said creek and the watercourse that extends from it to the town of Rochford, and also all other islands, rivers, streams, creeks, waters, watercourses, channels, harbours, docks, and places within the before-mentioned limits contained. And we, the said Lords Commissioners of Her Majesty's Treasury, do hereby annul all former limits of the port of London.—Whitehall, Treasury Chambers.—Dated this 23rd day of October, 1882.—CHARLES C. COTES, HERBERT J. GLADSTONE.

PORT OF ROCHESTER.—(LIMITS OF PORT).—We, the undersigned, Lords Commissioners of Her Majesty's Treasury of the United Kingdom of Great Britain and Ireland, do hereby, under the authority of the Customs Consolidation Act, 1876, appoint Rochester to continue and to be a port in that part of the United Kingdom called England, and do hereby declare the limits of the said port of Rochester shall commence at an imaginary straight line drawn from the north-eastern extremity of the Isle of Grain, in the county of Kent, to the pilot mark at the entrance to Havengore Creek, in the county of Essex, and shall extend from the said north-eastern extremity of the said Isle of Grain in an easterly direction across the entrance to the River Medway, and along the coast of the Isle of Sheppy to the Lands End, in the parish of

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Warden (being the boundary at the port of Faversham), and shall extend seawardly from the coast within the aforesaid limits, to a distance of three miles from low watermark, and shall include the River Medway and also the water called the West Swale, as far as an imaginary line drawn from the Elmley chapel, in the aforesaid Isle of Sheppy, to Swale church on the mainland of the county of Kent, the said line being also the boundary line of the port of Faversham, and shall include all islands, waters, watercourses, rivers, streams, creeks, harbours, and places within the said limits contained. And we, the said Lords Commissioners of Her Majesty's Treasury, do hereby annul all former limits of the port of Rochester.—Whitehall, Treasury Chambers.—Dated this 23rd day of October, 1882.—CHARLES C. COTES, HERBERT J. GLADSTONE.

PORT OF COLCHESTER.—(LIMITS OF PORT).—PORT OF MALDON ANNULLED.—We, the undersigned, Lords Commissioners of Her Majesty's Treasury of the United Kingdom of Great Britain and Ireland, do hereby, under the authority of the Customs Consolidation Act, 1876, appoint Colchester to continue and be a port in that part of the United Kingdom called England, and do hereby declare the limits of the said port of Colchester shall commence at the Naze Point, in the county of Essex (being the southern limit of the Port of Harwich), and shall extend from thence along the coast of the county of Essex to an imaginary straight line drawn from the pilot mark at the entrance to Havengore Creek, in the said county of Essex, to the north-eastern extremity of the Isle of Grain, in the county of Kent, and shall extend seawardly from the coast within the aforesaid limits to a distance of three miles from low watermark, and shall include all bays, channels, roads, bars, islands, harbours, havens, rivers, streams, creeks, and places within the said limits contained, except the islands in Havengore Creek, called Potton and Rushly Islands, and so much of the said creek and the watercourse that extends from it to the town of Rochford, and which are in the Port of London. And we, the said Lords Commissioners of Her Majesty's Treasury, do hereby annul all former limits of the Port of Colchester, and all former limits of the Port of Maldon, and declare Maldon to be no longer a port for Customs purposes.—Whitehall, Treasury Chambers, dated this

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23rd day of October, 1882.—CHARLES C. COTES, HERBERT J. GLADSTONE.

CARGO IN WATER-TIGHT PACKAGES.—Mr. R. B. Forbes, of Boston, U.S., advocates the employment of water-tight packages for certain classes of valuable goods on board ship. He says :—"Supposing that all goods were packed in water-tight bales, boxes or casks, and that every package would float if left to itself, the amount of water which could under such conditions be found in the cargo spaces would at the worst only bring the ship down a foot or two; but suppose the system which I advocate should be completely arranged and all goods be packed in square or nearly square boxes or bales, the amount of water coming in would be very much less than if the goods were packed in casks. Still I should, as a general rule, prefer casks, because they would have nearly their original value when unpacked, whereas bales and boxes would not. Casks would be available for return goods. In the days of the East India Co., all the goods sent to China were in water-tight bales; and valuable goods were sent to the Phillipine Islands packed in copper cases; or, I should say, in wooden boxes lined with copper carefully soldered. At first sight, it would seem that this was costly; but it was not so, for the reason that the copper paid no duty and was worth more than it cost. I assume that if we can afford to import Bordeaux wine, costing from 60 dollars to one hundred dollars a cask, we certainly can afford to put goods of from two to ten times those values into the same sort of packages. I assume that insurers would be glad to take risks free from claims for partial loss on goods packed as I suggest for very much less than when packed as is now the custom and subject to a claim for partial loss. This saving to the merchant would pay for the better packing ten times over. It would be easy to cite statistics to show that the large amount of valuable goods coming from Europe to this country and to other countries would warrant packing in water-tight packages. The *theory* of water-tight packages is well illustrated in China where every chest of tea is lined with lead; the object being to preserve the flavour of the precious herb; but, not one chest in ten is really tight; raw silk and silk piece goods are packed in bales and boxes quite pervious to water."

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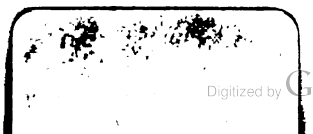
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